AMERICAN

OCTOBER · 1958

Cinematographer

THE MAGAZINE OF MOTION PICTURE PHOTOGRAPHY

In This Issue . . .

- Do-it-yourself Sound Recording
- Lens-coupled Exposure Meters Next?
- Animated Film Techniques—Part IV

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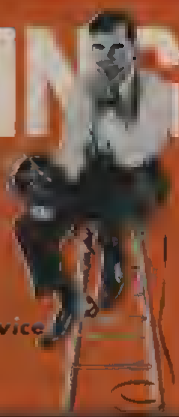

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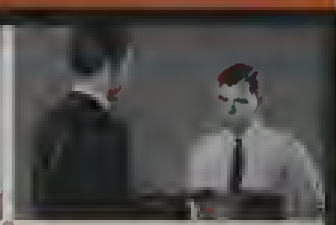

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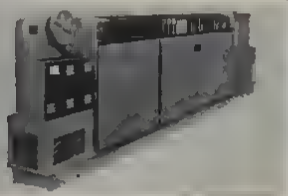

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Cinematographer

THE MAGAZINE OF MOTION PICTURE PHOTOGRAPHY
PUBLICATION OF THE AMERICAN SOCIETY OF CINEMATOGRAPHERS

ARTHUR E. GAVIN, *Editor*
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Editorial and Business Office: 1782 N. Orange Dr., Hollywood 28, Calif.
Telephone: HOllywood 7-2135

Vol. 39 OCTOBER • 1958 No. 10

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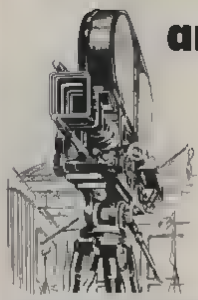
ON THE COVER

AT GENERAL MOTORS Desert Proving Ground, Mesa, Arizona Hal Mohr A.S.C. (in helmet) and camera operator Harry Wolf (behind camera) prepare to make a thrilling traveling shot at 70 miles per hour with the Technirama camera bolted to platform mounted on rear deck of General Motors' latest experimental car, Firebird III. At far left is Don Beavis, assistant cameraman. Campbell Ewald ad agency rep Don Miller is at far right. Story of the photography appears in this issue.

AMERICAN CINEMATOGRAPHER, established 1920, is published monthly by the A. S. C. Agency, Inc., 1782 N. Orange Dr., Hollywood 28, Calif. Entered as second class matter Nov. 15, 1927, at the postoffice at Los Angeles, Calif., under act of March 3, 1879. SUBSCRIPTIONS: United States and Canada, $4.00 per year. Foreign, including Pan American Union, $5.00 per year. Single copies, 75 cents; back numbers, 40 cents; foreign single copies, 50 cents; back numbers, 4 cents. Advertising rates on application. Copyright 1958 by A. S. C. Agency, Inc.

Mitchell Professional Accessories extend 16mm and 35mm camera use



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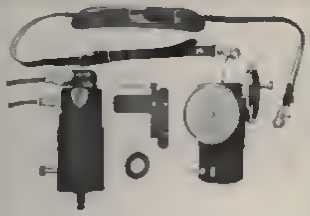

REMOTE CONTROL UNIT

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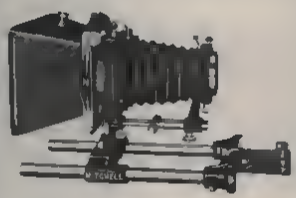

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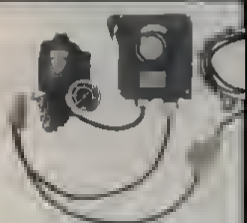

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INDUSTRY NEWS

News briefs of industry activities, products and progress . . .

Two 'Oscars' for Photography — Restoration of two awards for achievement in cinematography, which had regularly been voted until last year, has been announced by the Academy of Motion Picture Arts and Sciences. The Academy Board of Governors voted to restore, effective with the Academy's 31st Annual Awards Presentations next April, the second award for black-and-white photography which, along with several other awards, was voted out last year by the Academy. This means that there will be separate "Oscars" for black-and-white and for color photography.

At the same time, the Academy voted to also restore the second music scoring award, which had been voted out last year. Henceforth, one award will be made for the best scoring of a musical picture and a second for the best music score of a dramatic or comedy picture.

• • •

"Whatever the fluctuating fortunes of the motion picture business, Hollywood's television film industry will reach a plateau by the end of 1958 which can reasonably be expected to maintain over the next few years. Telefilm production, it appears, will settle down over the coming years as a $155,000,000-a-year Hollywood industry, with little fluctuation from that mark expected, unless its a hike in the figure due to rising costs."

The above quote from a recent issue of *Daily Variety* epitomizes the general feeling of renewed faith in the film industry that is evident everywhere in Hollywood, where all sorts of bugaboos ranging from video tape to up-grading of technical assistants to replace veterans has created some apprehension in the past.

As for video tape, while certain TV stations have become quite active in its use, thus far videotaping has made no dent whatever in TV film production on the West Coast. Indeed, indicative of the trend in thinking among the major networks is recent announcement by CBS that it will shift its entire vidpix production to Hollywood.

"CBS Films is planning the heaviest production schedule in its history during 1959, the major part of it in Hollywood," a CBS official stated, adding: "Our decision to concentrate on Hollywood production is predicated on the fact that acting and technical personnel there are superior to those found elsewhere."

• • •

Video Tape Trends. The following paragraph is from a recent column by Leo Kovner in *The Hollywood Reporter*, film industry tradepaper:

"Don't throw away your film machines for tape projectors yet, warns Grosse-Krasne v-p Jerry King, one of the pioneers in audio tape. 'There are some technical problems to be solved before video tape completely supplants film for TV, but the main problem is economic. I can't see any vast switch to tape in the near future in the syndication field.'

"'Let me point to one set of figures. A half-hour reel of tape stock costs $300. A comparable reel of 16mm film, completely processed, costs $30. Let's say we're distributing a syndicated series to a lineup of 43 Coast stations. At the $270 difference between tape and film, that's an additional $11,160 in print costs. That's a big nut to be swallowed in syndication.

"'Mind you, I'm not saying that tape will never completely replace film. It's a wonderful tool now, especially for timely events. After all, we're in the entertainment business, not the lab field. The day when our technical people come to us and say: 'You've got to put in tape because it's more economical than film,' that's the day we'll shift to an all-tape operation.'"

• • •

Director of Photography is the proper and only term of identification that may be used in screen credits where the name of the person photographing the picture is a member of Local 659, I.A.T.S.E. Where that person is also a member of the American Society of Cinematographers, the initials A.S.C. must also appear after his name.

This was explained recently in a general letter sent to all members of the cameramen's Local by President E. T. Estabrook.

"This (rule) cannot be changed by any individual and you are requested to inform your producer or department head whenever discussion is entered into concerning this subject that it is a matter covered strictly by Union contract," the letter further explained.

(Continued on Page 600)

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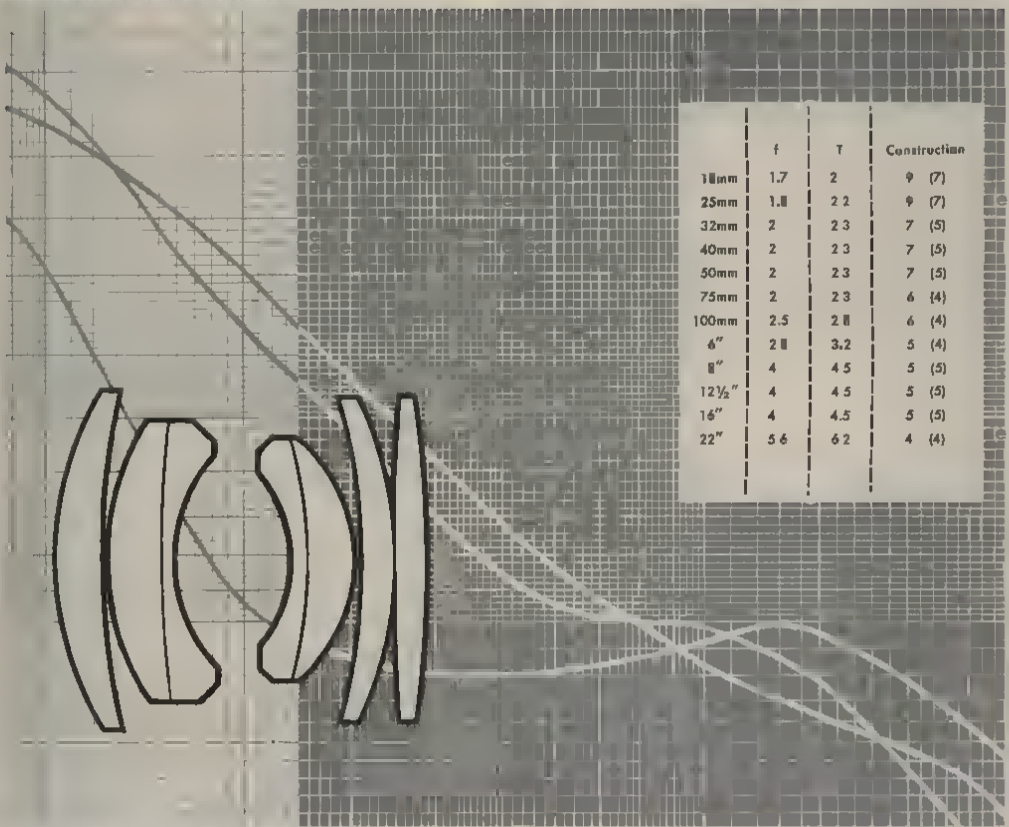

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25mm	1.8	2.2	9 (7)
32mm	2	2.3	7 (5)
40mm	2	2.3	7 (5)
50mm	2	2.3	7 (5)
75mm	2	2.3	6 (4)
100mm	2.5	2.8	6 (4)
6"	2.8	3.2	5 (4)
8"	4	4.5	5 (5)
12½"	4	4.5	5 (5)
16"	4	4.5	5 (5)
22"	5.6	6.2	4 (4)

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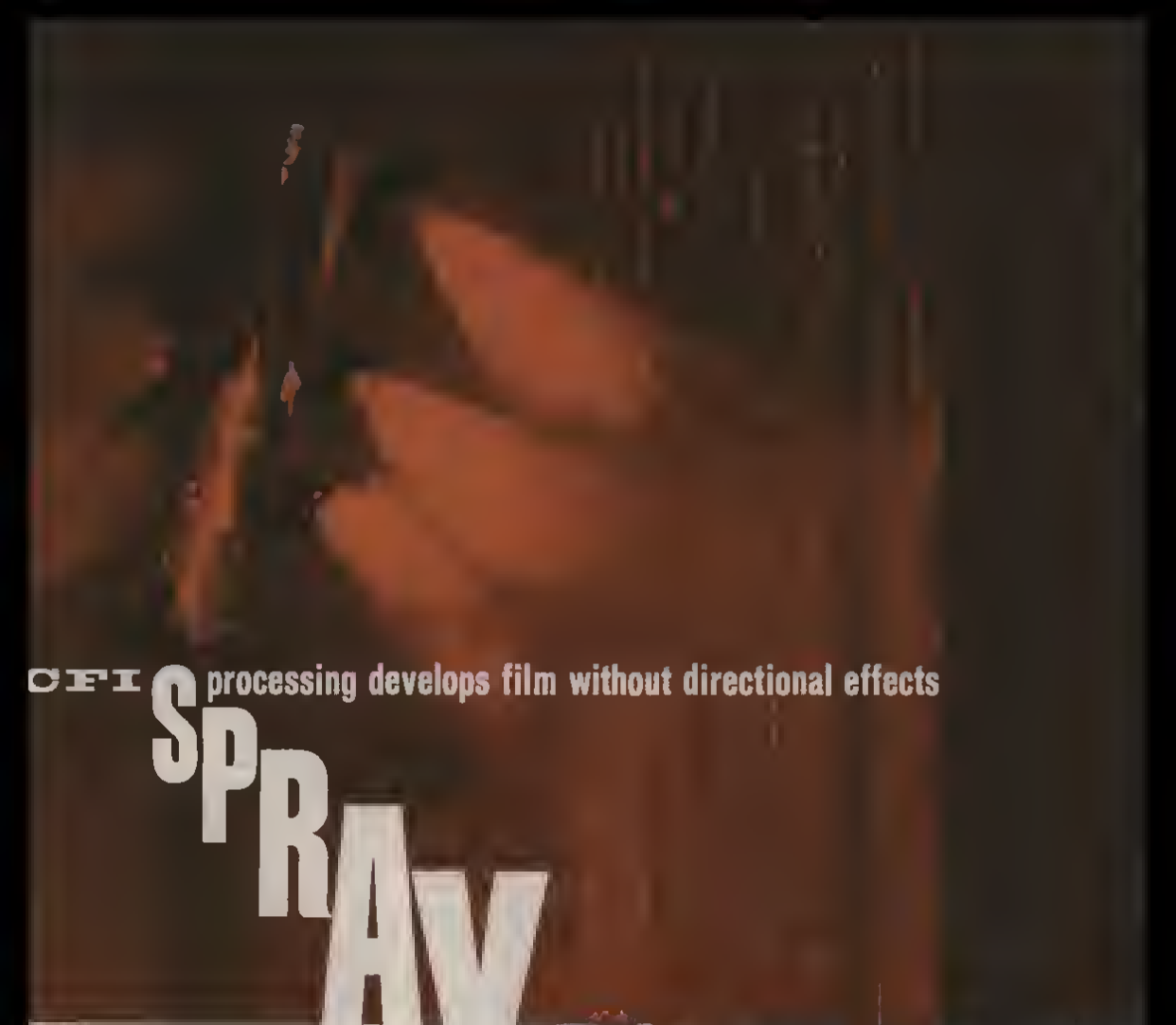

CFI processing develops film without directional effects

SPRAY

This is a close-up of black-and-white film being spray developed at CFI. This processing method eliminates directional effects.

Chief Engineer Ed Reichard, with CFI Hollywood for 25 years, shows a spray machine in operation. Both the Hollywood and New York laboratories of CFI are equipped with these machines.

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WHAT'S NEW

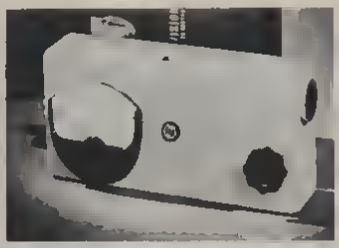
. . . in equipment, accessories, services

Robot Fecuser

The Mitchell Robot Focus Control is an important accessory for use with the Mitchell BNC camera which simplifies the procedure of making follow-focus shots. Through use of a slave-Selsyn component mounted on the camera, the Mitchell may be focused from a remote position by an assistant operating a matched transmitter mate at slow or fast speeds. It is ideally suited to making shots in extremely confining sets or when camera is crane-mounted or wherever the assistant cannot work close to the camera during the take. The Robot comes in a fitted case and may readily be installed on any BNC Mitchell. Further data and price are available from Mitchell Camera Corp., 666 West Harvard St., Glendale 4, Calif.

Quik Splicer

S.O.S. Cinema Supply Corp., New York and Hollywood, is distributor of the Studio Quik Splicer for 16mm, 35mm and magnetic tape. A butt-type splicer, it may be used with all types of film bases as well as optical or magnetic sound tracks. In the splicing operation, Mylar tape is applied. This special tape is pre-cut to the correct size and paper-backed. All splicer components are made of cast bronze and non-magnetic steel. List price is $79.50. Mylar tape patches in handy dispenser lists for $5.00 per package of 250. Free samples of tape and illustrated brochure is available free from S.O.S.



Brightness Meter

Camera Equipment Company, New York, has been appointed Eastern distributor for the Panavision Brightness Meter. Instrument provides an objective analysis of screen brightness, and screen brightness distribution (side to center), etc. While designed primarily for measuring theatre screen brightness, it has application in other fields. Photographers, using telephoto lenses, can employ it to determine exposure levels for distant objects. Meter is of the "visual comparison" type. No "warm-up" period is necessary. Uses a single 1½ volt flashlight battery. List price is $97.50.

Lighting Catalogue

Mole-Richardson Co., 937 No. Sycamore, Hollywood 38, Calif., announces a new 44-page catalogue illustrating and describing Mole-Richardson set lighting equipment and accessories. The detailed specifications, photographs and descriptions make the catalogue virtually a handbook on motion picture set lighting. Several pages are devoted to helpful tables and data on studio lighting. The 5-page price list has been completely revised. A free copy will be sent on request.

Camera Barney

Birns & Sawyer, 8910 Santa Monica Blvd., Los Angeles 46, Calif., offer a sound-muffling barney (fabric blimp) for Arriflex 35mm cameras. Said to reduce camera noise 65%, the barney is constructed of kapok, lead foil, flannel and foam rubber. Exterior is covered with heavy duty green duck. Barney will enclose with ease the 35mm Arri camera, including 480-ft. magazine and either wild or sync motor. List price is $99.50.

Monocular Finders

Following purchase by Photo Research Corp., Hollywood, of Hi-C Products Co., Pasadena, company will immediately step up production and distribution of Hi-C line of magnifying monocular viewfinders for Mitchell, Auricon, Wall and other motion picture cameras as well as focusers and boresights. Products henceforth will carry the Photo Research Co. "Spectra" label. Products have wide application in fields of missile research, ordnance tests, and for newsreel cameras and TV cameras used in sports events recording.

Camera Literature

Literature on a new 200-frame-per-second 16mm camera designed for use in missile tracking, testing and for airborne flight data recording is offered by Gordon Enterprises, 5362 No. Cahuenga Blvd., North Hollywood, Calif. Literature gives full technical details on the "Gordent 200" camera, which measures only 6" in length and 3½" x 2½" in height-width. Special c50T high speed film magazines are also described in addition to optical and other accessories.

Variable Shutter Feature

Pellegrini-Piek, San Francisco, announce that all installations of their variable shutter units for Bolex-H cameras include a special warning signal for closed shutter position. •

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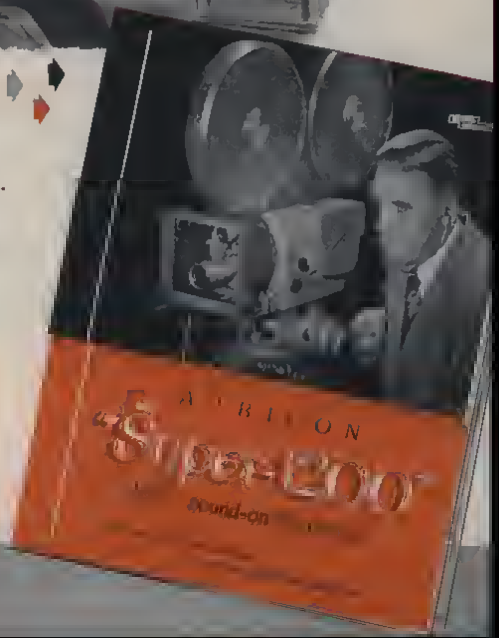

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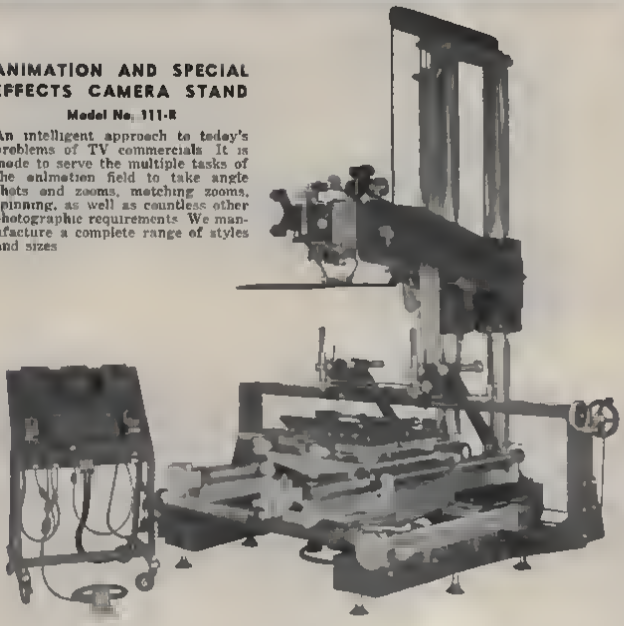

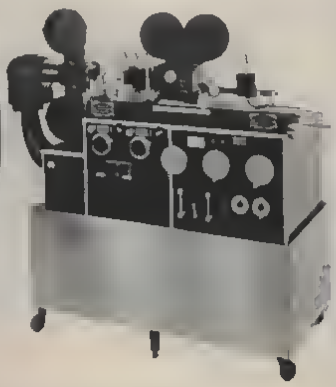

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INDUSTRY NEWS

(Continued from Page 595)

Paillard Inc., U. S. Distributors of Pan Cinor variable focus (zoom) lenses, has won a complete and final victory in the patent infringement suit brought against it by Zoomar, Inc. The U. S. Court of Appeals has upheld a district court decision in Paillard's favor.

After examining history of development of the variable focus lens, the U. S. District Court for the Southern District of New York decided that Zoomar's patent is invalid. The Court issued an injunction restraining Zoomar from bringing similar suits against customers of Paillard, Inc. These actions were upheld by the Court of Appeals.

• • •

Cinematograpic Achievement — It isn't feasible, of course, to publish reviews or articles descriptive of the photographic undertakings on all the outstanding films that are released each month. Too often there will be several outstanding films released within a 30 day period, and sometimes—despite their outstanding qualities—they are in and out of release almost before the editors of *American Cinematographer* have opportunity to interview the respective cinematographers responsible for their noteworthy photography.

A case in point is "The Hunters," produced by 20th Century-Fox. Despite the many entertaining qualities of this picture and its outstanding photography it didn't fare well at the box office. Nevertheless, the editors should liked to have published an article descriptive of the camera work on "The Hunters," a two-man accomplishment with Charles G. Clarke, A.S.C., directing the picture's general photography, and Tom Tutwiler, A.S.C., doing the photography of the fine aerial sequences.

With each new color production assigned to him, Clarke seems to further perfect his unique style of set lighting. It is different as it is interesting to behold. The many interiors in this production have a pictorial quality that invariably provides a compatible framework for the scene enacted therein—thanks to Clarke's skillful placement of lights to complement each step of the action portrayed. And his handling of the sequence of scenes in the bomb-torn mission, both in lighting and camera treatment, is an outstanding piece of cinematography.

Tom Tutwiler, by reason of his aerial photography accomplishments on this picture becomes the undisputed "ace" of aerial cinematographers. In 'The Hunt-

(Continued on Page 648)

Here's the team that quality built

It takes a team of emulsions to produce a screened image of superb quality.

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16mm Anscochrome Professional Camera Film Type 242 has gained universal recognition as *the* quality leader color original stock ideally suited for duping.

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And use Super Anscochrome 16mm (exposure index 100) for all those tough assignments in available light and you will know, as many top cinematographers do, that the best comes from Ansco! Ansco, Binghamton, N. Y. A Division of General Aniline and Film Corp.

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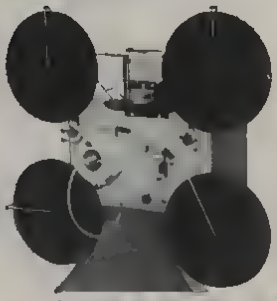

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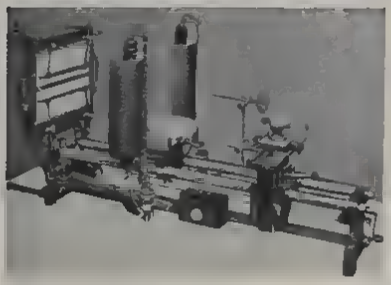

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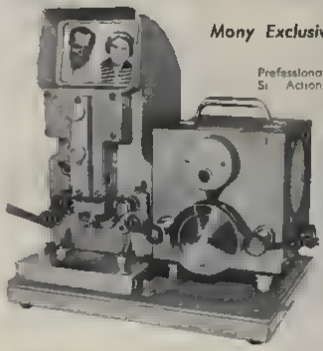

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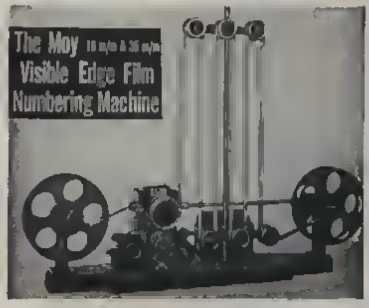

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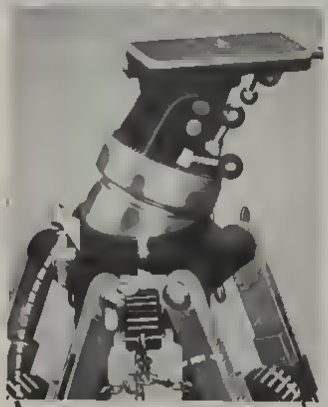

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HOLLYWOOD BULLETIN BOARD

News briefs about the A S C — its members, and important industry personalities

STATION KTTV, Los Angeles, hosted members of the American Society of Cinematographers recently in a demonstration of video-tape recording. Host was KTTV's chief engineer Ed Denham (rear, 2nd from right) here explaining operation of video tape recorder to Paul Vogel, ASC, right, and to Harold Stine, ASC, and Charles Clarke, ASC, on his right. Earlier the cinematographers witnessed the tape recording of station's "Divorce Court" program.

SPECIAL EFFECTS expert Linwood Dunn ASC for 29 years with EKC where he was a director of special effects photography, later headed the department, visited New York recently to study latest effects and animation techniques in east coast laboratories. Dunn heads Film Effects of Hollywood, specialized film laboratory.

LEO SOSSI (left) cameraman for Edward R Murrow's CBS TV 'See It Now,' was in Hollywood last month shooting a segment for Murrow's Gleicher 12th show. While there he visited John Sayle, ASC at ASC clubhouse. It was first time two had met since 1915 when Sossi worked as Sayle's camera assistant in New York.

SILVIO PELUFFO (right) cinematographer for U.S Information Agency in Libya, was recent Hollywood visitor. Hosting him at ASC Clubhouse was Society president Walter Strenge. Purpose of Peluffo's visit was to gain first hand knowledge of Hollywood film production methods.

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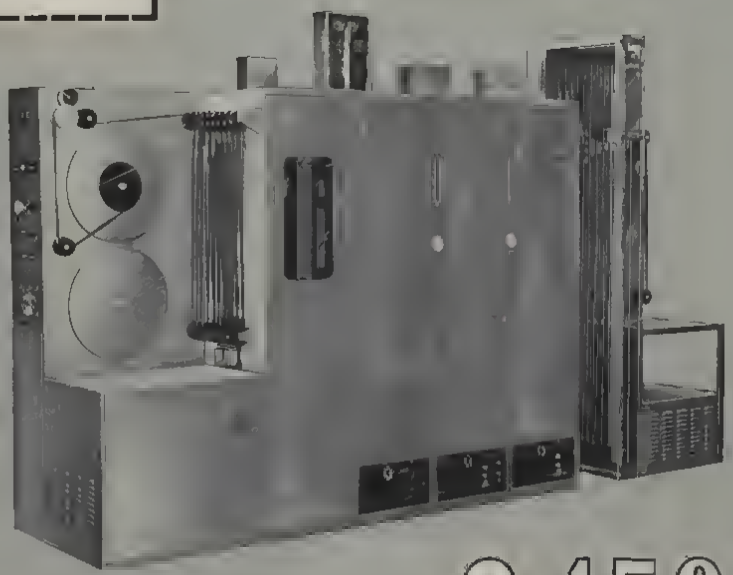

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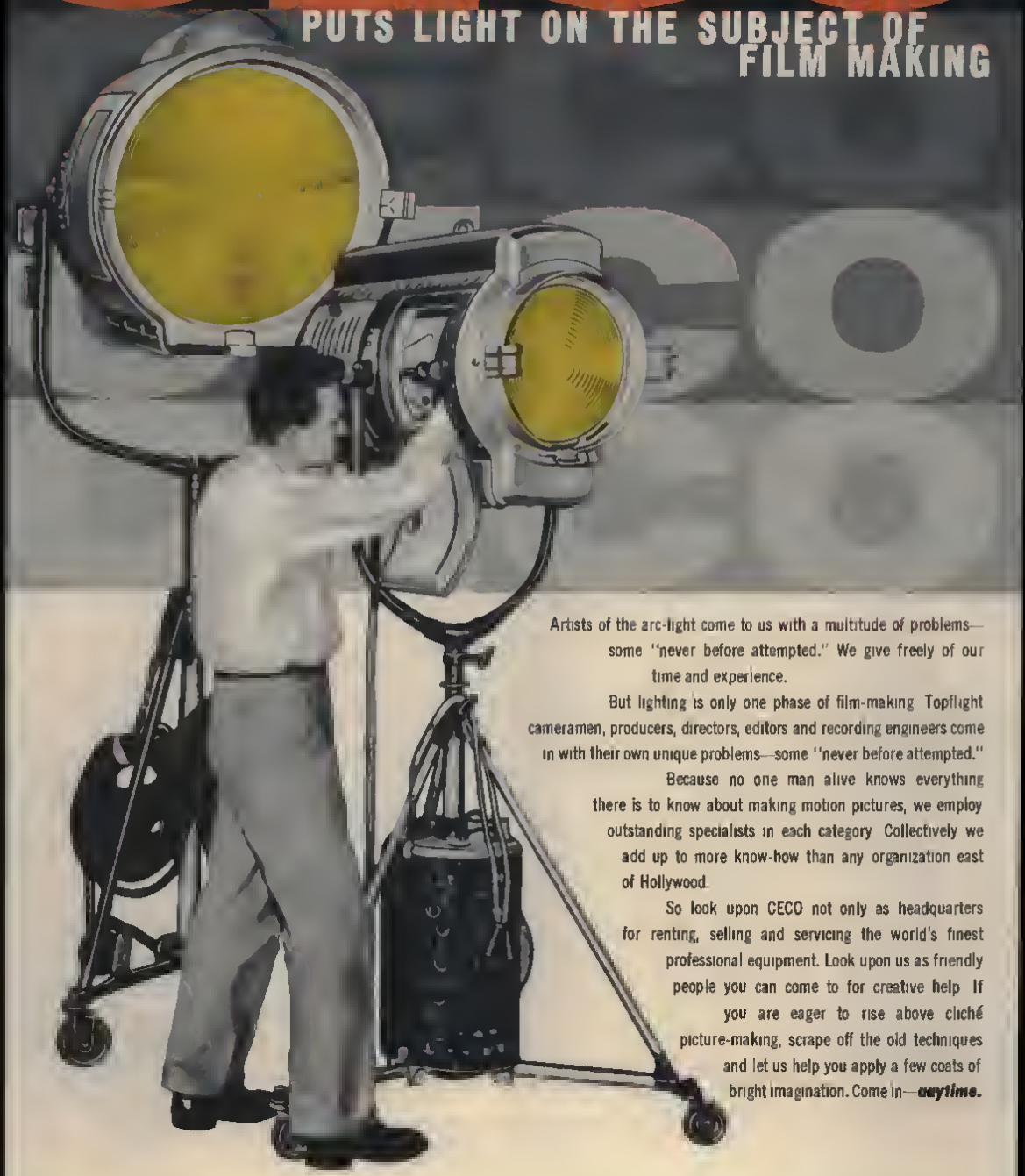

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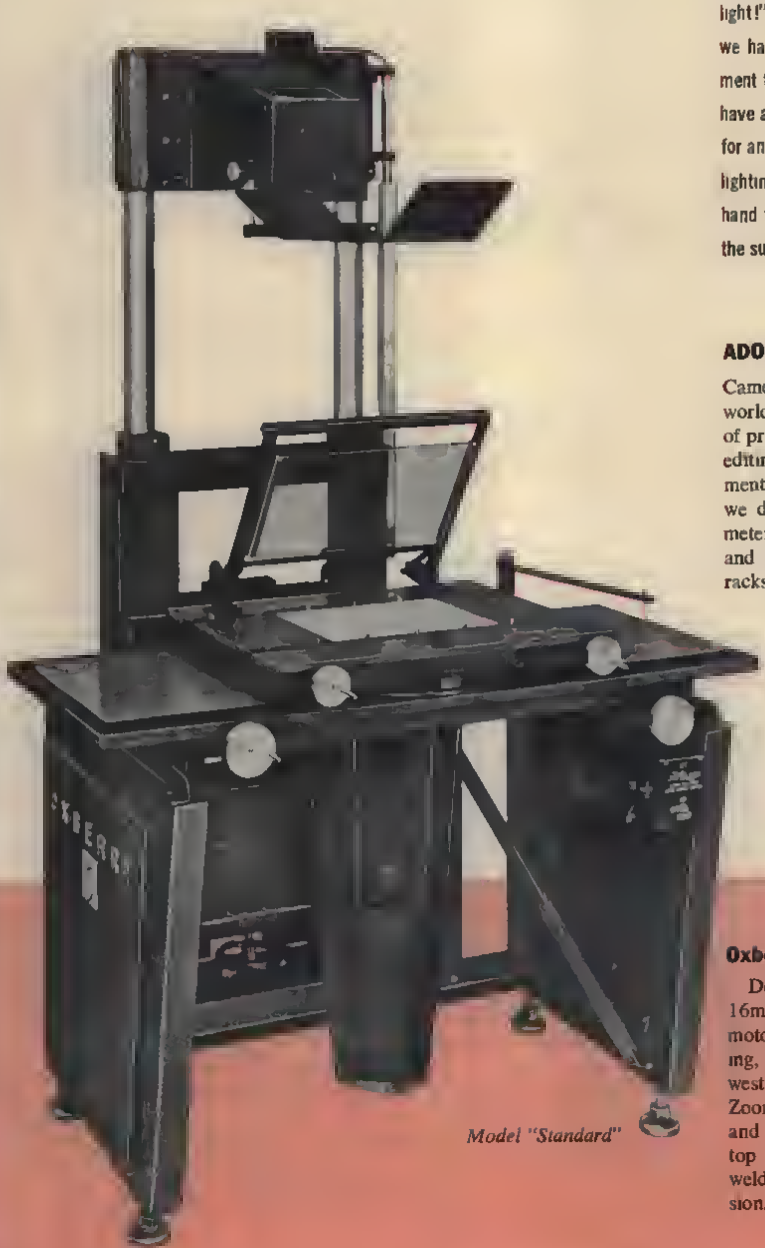

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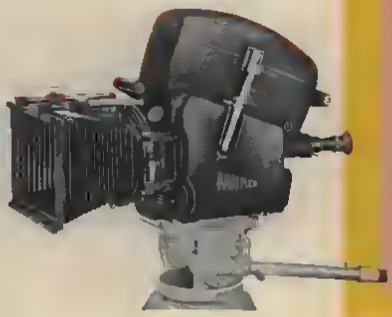

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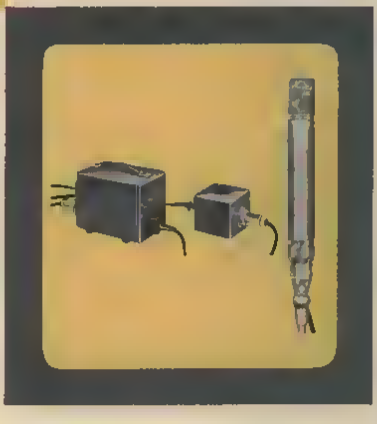

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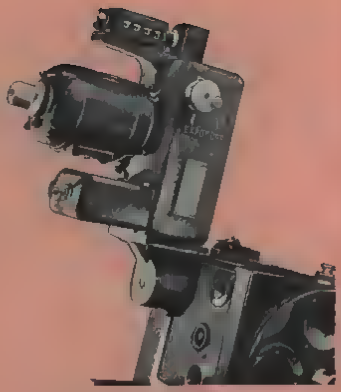

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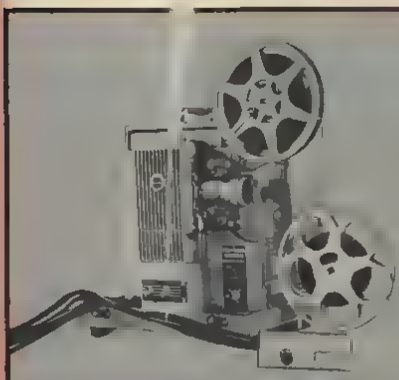

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TECHNICAL QUESTIONS & ANSWERS

Conducted by Walter Strenge, A.S.C.

QUESTIONS relating to cinematography or other phases of film production are invited from readers and will be answered by letter by Walter Strenge or by other qualified members of the American Society of Cinematographers. Questions and answers considered of general interest will appear in this column —*Ed.*

Q The article on post-production recording of dialogue and/or sound effects brings to mind a couple of questions. I assume that the common practice is to loop dialogue by using a cue-track, or use a combination of picture loop and cue-track, enabling the actor to record the required dialogue while hearing a playback loop of his own voice, or while hearing a playback loop and viewing a picture loop of the scene.

My questions concern the feasibility of post-production recording of dialogue from a picture loop alone—that is, having the actor record while viewing his action on the screen, and matching his dialogue to the lip movements on the screen (omitting use of a track loop).

Has such a system been used to any extent? What are its advantages and disadvantages? Is it more time-consuming and therefore more costly? Is it more difficult for the actor to read his lines believably using this method? —*P. H., Los Angeles, Calif.*

Answer. Where exact synchronization of replacement lines is desired, most studios use both a picture and a sound loop of the scene involved. In preparation for the dubbing take, the sound is reproduced both through a speaker and earphones in sync with the projected picture. The actor watches the picture, listens to the sound, and reads the dialogue in sync with what he hears and sees.

The speaker is then cut off and the microphone switched on so that the sound mixer and the director can hear the actor's words. Meantime, the sound recorder is started and when a satisfactory reading is obtained (and recorded) the respective take is marked for dubbing.

As far as the actor is concerned, screening the picture helps him gain the feel of the scene. Another important reason for projecting the picture is that the director can check actor's sync and dramatic expression during the recording to insure a satisfactory take.

In most cases the actor can do a better job of dubbing a line replacement with a sound loop reproduced through earphones and no picture as contrasted to viewing picture with no sound. —*Loren L. Ryder, A.S.C. Associate*

Q I have an assignment to shoot a series of religious pictures in 16mm color in Singapore, where the sun will be overhead most of the time and the light quite intense. I will be shooting either Kodachrome Commercial or the new 16-mm Ektachrome commercial film. Shooting will take about six months.

I would appreciate your suggestions on exposure and contrast control, on the storage and handling of film under tropical conditions, and any other advice you may feel would be of assistance.—*T. E. S., Chester Springs, Penna.*

Answer The use of sunlight reflectors to fill in deep shadows is the most practical method to follow to maintain contrast control where intense, overhead light prevails.

Film storage should present no problem if film is kept in the same taped can it is received from the factory or supplier until time for use. In no case should more cans of films be unsealed than will be used in one day's shooting.

To keep exposed film dry and moisture free in the tropics, take along the means for desiccating it. A metal container with a tight-fitting lid that can be sealed with tape, and a supply of silica-gel will do. Each roll of exposed film should be placed in the desiccator for a period of 24 hours, during which time the silica-gel will absorb any excess moisture in the film. After desiccation the re-packed negative should be carefully sealed in its container with tape and the tape itself then sealed with an application of lacquer. Where it is possible to keep films refrigerated, do so.—*Walter Strenge, A.S.C.*

(Continued on Next Page)

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QUESTIONS & ANSWERS

(Continued from Preceding Page)

Q I have used some 800 feet of 16mm film in trial-and-error efforts to produce titles superimposed over a Kodachrome still. I would like to achieve clear-cut title text over art work without one bleeding into the other. How can I do his?—*H. B. M., Chicago, Ill.*

Answer: The best method for superimposing white title text over a 35mm Kodachrome still is by double (successive) exposure.

If your camera provides visual focusing and alignment and your lens can be set further out by means of spacer-adapters of the correct size to accommodate the field of the small still, you should be able to obtain good quality reproduction of the still. If your equipment will not permit following this method, then the still for your title background can be copied by background projection — using a back-projection screen of fine texture.

The title lettering should be done in white on a glossy black card, or lettered on a glass panel which should be placed in front of a dead black blackground when being photographed. The title should be exposed normally, and the film then wound back in the camera for re-exposure to the background.

Exposure of the background still should be held down to balance properly with that of the title lettering, which will allow the title text to stand out. The correct exposure for this step can best be determined by first running a series of density tests.—*Linwood Dunn, A.S.C.*

Q I have been collecting 16mm silent films for a number of years and would now like to edit them into thousand-foot reels and add sound and narration.

I know nothing of the process of adding sound to films, so my problems are basic. First, I would like to know if silent films (16 f.p.s. speed) can be converted to sound film speed? Also, among films I have collected are records of World War II, for which I will need sounds of military activity, etc. Where can such sound effects be obtainrd?—*J. S., Millbrook, N. Y.*

Answer: Films shot at 16 f.p.s. cannot satisfactorily be converted to 24 f.p.s. for normal sound speed presentation. However, you can have a sound negative made for screening at 16 f.p.s. Most 16mm sound projectors also operate at 16 f.p.s. For sound effects records write Boosey & Hawkes, 30 W. 57th St., New York 19.—*Loren L. Ryder, A.S.C. Associate.*

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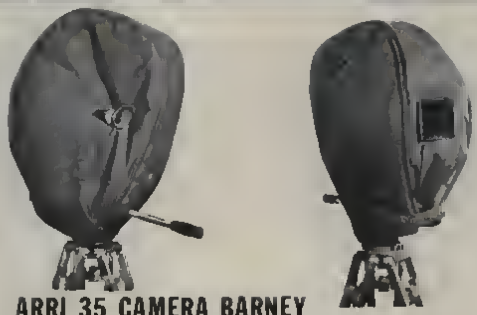

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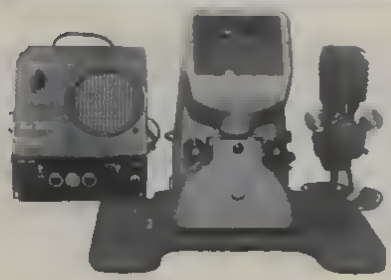

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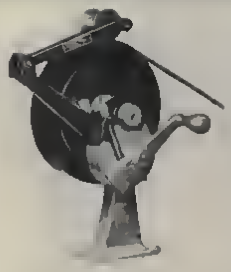

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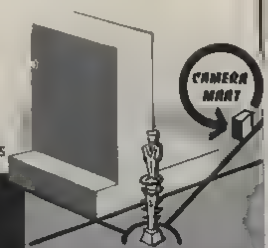

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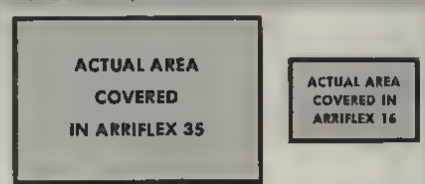

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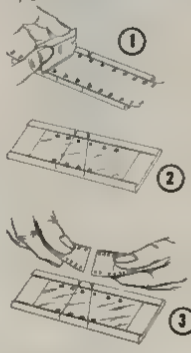

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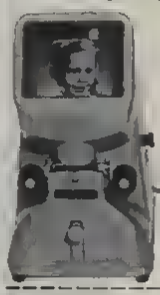

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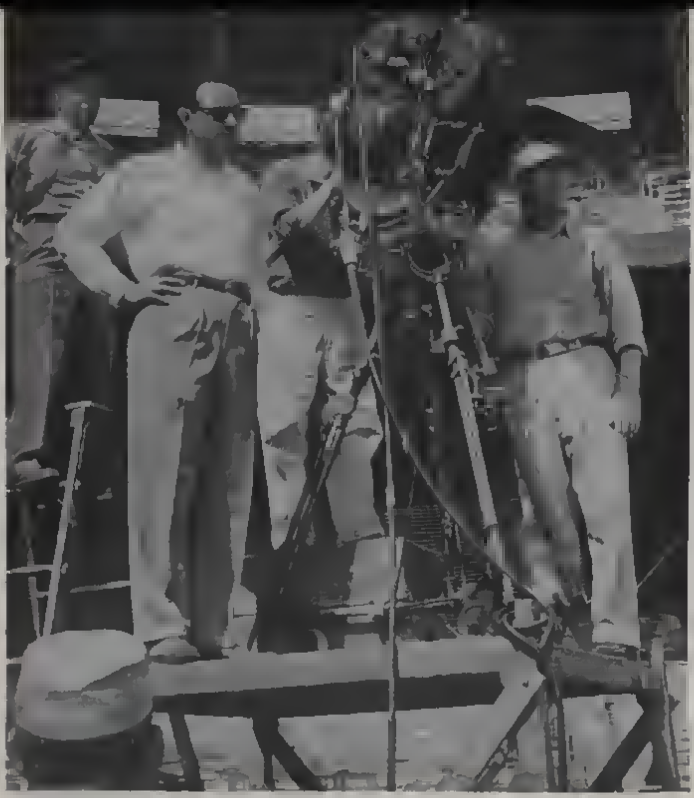

DIRECTING PHOTOGRAPHY of scene in baseball park for "Damn Yankees" is Harold Lipstein, ASC, far left in left foreground is director Stanley Donen This was one of few instances when static camera was used moving camera shots predominate in picture

NOVELTY AND ORIGINALITY MARK PHOTOGRAPHY OF 'DAMN YANKEES'

Tinted lighting ond imaginative use of mobile camera enhance photography of hit musical film.

By ARTHUR E GAVIN

TAKE A FABULOUSLY successful Broadway musical comedy and its equally fabulous cast, transfer them bag and baggage to the sound stages of Hollywood, add a top name film star for extra measure then give the story the benefit of imaginative photographic presentation in wide-screen and color—and you have the makings of a spectacular, colorful and tuneful musical. This is what Warner Brothers did with "Damn Yankees," one of the very great musicals of all time

While the play was a smash hit on Broadway, playing to standees for more than two and a half years, it still was stagebound Because of the narrow confines of the stage, much of the action had to be imagined, especially the baseball sequences street scenes and others that required the outdoors

Photographed for the screen, all the missing details of the stage presentation are filled in And in addition, there is the benefit of the camera's flexibility in pointing up a character, a nuance of expression, or some important detail by means of a closeup; of making the transitions of the aged baseball fan to young player, and the exotic Lola to witch visually compelling instead of just something left to the audience's imagination. There is one other detail, too, that the photographed version has—artistry in color plus imaginative camera treatment of the more than a dozen musical and specialty numbers featuring the play's top stars.

Harold Lipstein A.S.C., whose cinematographic talents were never given opportunity for full expression during the more than 25 years he was with MGM studios, directed the photography and what he has done with camera and lights in putting "Damn Yankees" on the screen is a fine example of what a truly imaginative cinematographer can do, given the right opportunity

Stanley Donen, also an MGM alumnus, directed "Damn Yankees." Long a firm believer in the motivational potentials of the moving camera, Donen, perhaps, is better versed in the mechanics of cinematography than many of his contemporaries. And it is this quality in the man that encouraged Harold Lipstein to strike out in new directions with lighting and camera treatment for "Damn Yankees." The picture's photography is noteworthy for three things: the subtle use of colored light in set illumination, intricate boom shots; and almost constant but restrained use of the moving camera.

The story of "Damn Yankees" revolves around a middle-aged baseball fan (Bob Shafer) who becomes disgusted with the way the Yankees' ball club continually blasts the Senators and always wins the pennant. Snapping off his TV

set when the Yankees win another game, he says aloud that he would give his soul for "one long ball player!" Materializing from nowhere, the Devil (played by Ray Walston) takes him up on his statement and makes a deal whereby the middle-aged fan is transformed into a youthful baseball hero (played by Tab Hunter). This leads to all kinds of complications and wonderfully satirical situations, for the Devil can make his creation do anything on the ball field. At the same time, he also complicates his home life. Just to keep the ball player in line and interested in his new youth, the Devil restores to life a Rhode Island witch who had been burned at the stake some 172 years before and transforms her into Lola—a glamorous, seductive dancer (Gwen Verdon). Trouble is, she falls in love with her victim and makes the Devil mad. The story then builds to a wonderfully funny and also sad climax as the middle aged ball player and the former witch hoodwink the Devil so that the Yankees lose the pennant and the ball player resumes his original being, back in the safe and comforting arms of his wife.

Mentioned earlier were the three high points of the photography: use of colored light, intricate boom shots, and the moving camera. It was when shooting the first scene for the film that director of photography Lipstein made excellent use of the first-mentioned technique. This was Lola's boudoir set which he illuminated in subtle tones of lavender and pale purple.

"I projected colored light into every scene in this picture," Lipstein explained. "It takes a lot of courage to go on a set of a three million dollar picture and start playing around with colored light. But that is what I did—with Director Stanley Donen's blessing, of course. There is sound theory to employing colored light in scenes for certain types of pictures, the main thing is to know how to apply it subtley, and how to gear it to the particular mood of a scene or sequence."

"My main theory on blending light colors," Lipstein further explained, "is to give a scene a pictorial tone that's different, to give it unusual eye appeal by using colors you do not ordinarily see in color productions—things you wouldn't do, of course, in a dramatic film. The important thing is to avoid using colored light in great strength."

"For scenes in Lola's boudoir, we felt that a delicate hue of lavender in the general illumination would enhance the feminine aspect of the set and point up the capricious mood of Lola in this particular sequence. It is in these scenes that Lola's charm and vivaciousness, plus her

(Continued on Page 646)

SHOOTING "SHOELESS JOE" ballet number in Wrigley Field with the Mitchell camera mounted on a camera crane. Long, sustained take is one of most intricate boom shots ever made for an exterior musical number. Colored gelatins may be seen mounted in front of all booster lights. Reflectors in background lit up shadow areas in grandstand, out of picture at left, which formed background for scene.

NIGHT EXTERIORS for "A Night To Remember" were actually shot at night. Here British cinematographer Geoffrey Unsworth and his crew shoot a lifeboat scene for the picture on a fake location, using a single brute on a high parallel for the key light.

Filming "A Night To Remember"

For most shots in this film of the Titonic disoster there couldn't be o key light; there wos no moon the night the ship went down. So British comeromon Geoffrey Unsworth oimed for a starlight effect.

By DEREK HILL

"A NIGHT TO REMEMBER" is the most ambitious production by the Rank Organization in many years. It cost over £600,000 (about $1,700,000) which is a staggering figure for the British film industry, where budgets are often a fraction of the Hollywood equivalent.

Director Roy Baker—remembered for his inspired handling of 3-D in "Inferno"—chose Geoffrey Unsworth, B.S.C., as director of photography. Unsworth had already worked with Baker on three other productions and the two found that they thought along similar lines in their approach to pictorial problems.

"Roy Baker isn't a director who confines himself to handling the actors," Unsworth told me. "He controls every aspect of a production. I'd like to work with him all the time."

UNSWORTH, left, demonstrates his method of evaluating set lighting, using a Jaca-Saifard meter.

"A Night to Remember" tells the story of the sinking of the *S.S. Titanic*. The tragedy has been filmed before but it has only been used as background to essentially fictitious stories. This new production attempts to tell the full story of the disaster as it actually happened.

Twenty years of research went into the book by Walter Lord on which the film is based, and Rank's research team continued where he left off. Every incident in the film is guaranteed to be authentic. The only concessions are occasional compressions of two characters into one for purposes of screen time.

"It was the most difficult film I've ever worked on," confessed Unsworth, "but at the same time I think it's my favorite. We set out to recreate the whole atmosphere of the disaster, and I think we did it."

Virtually the entire deck space of the huge *Titanic* was recreated as an exterior set at Pinewood. "It was forty feet in height," recalled Unsworth, "which meant that lamps had to be mounted on poles—and they still had to be mobile. We shot all the night exteriors at night. There was no water for these sequences, in fact by daylight the whole structure looked pretty peculiar with cows wandering about underneath it!"

The set represented the port side of the *Titanic*. Another set for the starboard side would have sent the budget soaring still higher, so Unsworth shot into a mirror and reversed the whole set for these scenes.

(Continued on Page 642)

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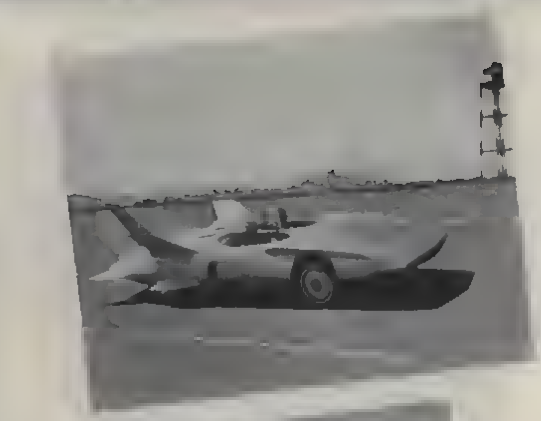
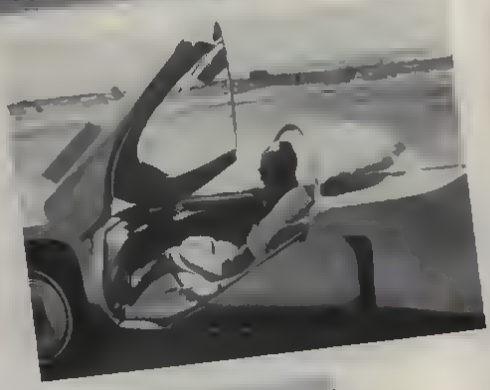
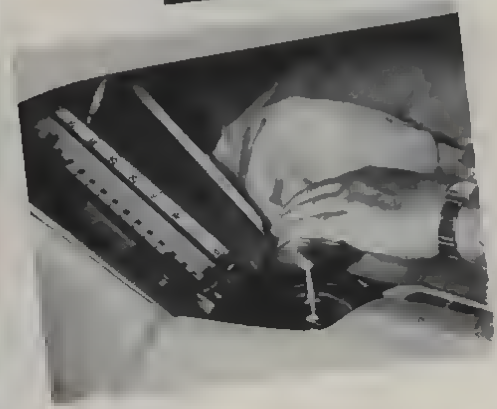
Filming A

By FREDERICK FOSTER







INDICATIVE OF THE growing interest evinced by industry to employ veteran Hollywood directors of photography and the latest wide-screen systems for its industrial motion picture productions is recent assignment of Academy Award-winner Hal Mohr, A.S.C. to photograph in Technirama a short film for General Motor's current Motorama show Although the finally edited version is but 6 minutes in length in screen time, it required 10 days to film in two locations—Detroit and at General Motors Desert Proving Ground in Arizona

The film, "Imagination In Motion," pictures General Motors' latest experimental car, Firebird III, from planning board to its emergence on the test track a sleek, swept-wing turbine propelled vehicle of tomorrow—with a jet-like flight on the test track straightaway for a smashing climax.

When Mohr was summoned to Detroit to huddle with the motor company's engineering executives and advertising men in the pre-production planning of the film, the Firebird III was still on the drawing boards, although General Motors' engineers knew exactly what the car was to be once it took form The customary clay mockup already was receiving finishing touches when Mohr moved into GM's Technical Center with the Technirama camera to begin shooting this spectacular promotional film in 35mm color

Firebird III is said to be the first car ever designed around a single stick control system which eliminates the conventional steering wheel, brake pedal and accelerator. Like its predecessors, Firebird I and Firebird II, which were first shown publicly in GM Motoramas of 1954 and 1956, the new Firebird was conceived and styled by Harley J. Earl, GM Vice President in charge of the company's Styling Staff

A two passenger, gas turbine powered car, it is missile like in appearance as well as in engineering details. Tools of the space age—electronics, transistors and computors—are employed to guide the car automatically and control passenger comfort. Because only one Firebird III will ever be built, it was the function of the motion picture Mohr was about to photograph to show millions of Americans who will visit GM's Motorama the results of General Motors' unrelenting search for better transportation for the future.

From the detailed script, director Dick Lyford visualized its most important aspects in the form of a rough story board, which became the springboard from which the shooting was projected The major part of the pic

PHOTOS AT LEFT show contours and features of General Motor's latest experimental car, Firebird III, which is the subject of a 6-minute color film photographed by Hal Mohr, A S C and being shown at current Motorama show. An outstanding feature of car is absence of steering wheel which is replaced by centralized single-stick control for steering, braking, acceleration, etc., pictured in bottom photo

Flash Of Tomorrow

General Motors' latest experimental car gets full glamour treatment in a 6-minute film photographed in Technirama by Hal Mohr, A.S.C.

ture's footage was shot at GM's fabulous Technical Center, near Detroit The picture story, filmed entirely without sound, begins in the Styling Department of the Technical Center, which was introduced in two carefully composed shots of the structure's facade and grounds The crane-mounted Technirama camera then was moved inside for a long shot of the drafting room. From here it dolhed to a closeup of a drawing board on which was mounted a sheet of blueprint paper A hand entered the scene and drew a bold line in yellow across the sheet of paper Other hlueprints and drawings falling successively into place on the drawing board showed the evolution of the Firebird III on paper Here, each take was shot for A&B dissolves hy the laboratory to smooth out the transitions and give added pace to the sequence.

Ensuing shots pictured the various departments involved in the car's styling, engineering and construction. Special lighting and camera treatment was given to photography of the mockup, which shows the designer's concept of the car that evolved from the myriad of hlueprints and sketches shown seconds earlier

Meantime, the Engineering Department was putting finishing touches on the turhine engine and the score of electronic components that go into the car All these were photographed briefly in various stages of development, in a manner that would best complement the picture's narration.

"Our most interesting and exacting scene at this stage," said Mohr, "was one that shows the chassis mockup being assembled in a stop-motion dolly shot, with the various parts dropping magically into place as the camera moves slowly alongside This was probably the most intricate and time-consuming sequence in the whole picture to photograph It had to be carefully planned so that it would occupy exactly the 14 seconds screen time allotted to it in the script

"Because it was much easier and surer to remove a part than to tediously fit it

(Continued on Page 638)

AT GENERAL MOTORS' Desert Proving Ground at Mesa, Arizona, director of photography Hal Mohr, in helmet at left and his camera crew prepare to make a traveling shot with the Technirama camera mounted low on special platform secured to rear deck of the Firebird At right of camera is Harry Wolf, veteran Hollywood studio operative cameraman.

WHILE MOHR'S camera crew mount the Technirama camera on camera car for a series of running shots, two cinematographers from General Motors' Photographic prepare to shoot similar footage with a 16mm and a 35mm camera for a dealer information film

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FIG 1—An animator tries out a facial expression in the mirror before transferring it to the whimsical cartoon character he is drawing (Photo © by Walt Disney Productions)

Animated Film Techniques

PART IV: The Animator's Problems

By CARL FALLBERG

THE ACTUAL TASK of making animated cartoon characters *move* falls to a crew of artists known as animators. They usually work at specially-constructed desks having sloping tops, in the center of which are ground-glass windows lighted from beneath. Here the animator may pile a sequence of drawings one over the other, so that he can check on the particular phase of action on which he is working. Usually he is concerned only with developing the "key" drawings showing the extremes of the action. Another artist, known as "in-betweener," takes these key drawings and subsequently draws the required number of pencil sketches needed to fill in the sequence of action between the extremes. On this phase of animation we shall go into later in greater detail.

The animation of a cartoon is handled very much the same as the shooting of a live-action picture—scene by scene and not necessarily in sequence. Each scene is timed out for its required screen footage before production—just the reverse of the procedure for live action films. This method generally makes for more precise control over all the elements of the picture and provides a reasonably definite course for the animator to follow. Changes in timing, which will shorten or lengthen scenes, may yet occur as the animator works out his idea of the action.

Several animators usually work on each animated cartoon production—each handling a block of scenes in their respective order. Sometimes one animator's work will be scattered throughout the picture. But so standardized has professional animation style become that it is almost impossible to differentiate between the work of the various men in a particular studio. Obviously complete coherence of style is necessary in order to compromise with the assembly-line production methods of animated cartoons today.

The problems confronting an animator when starting a scene vary according to the type of action called for. For example, a scene containing dialog will require a different approach than one comprising straight action. Also, there are different types of straight action: personality pantomime, fast action, etc. No two scenes are ever quite alike, each new scene undertaken by the animator will have its own particular problems.

It would be quite impossible to lay down any specific set of rules governing the procedures for every type of scene on which an animator may work. However, there are certain general procedures concerned with animation mechanics and timing that remain constant and applicable to almost any animation problem.

The animator has opportunity to become pretty thoroughly saturated with the intent and purpose of each scene in a production prior to actual animation when he meets with the director, at which time the story action is carefully described and timed down to its smallest component. At this time he is provided with the working set-up of the scenes by the layout-man who indicates position, size, and path of action of the character or characters taking part in them, and diagrams the camera moves.

An exposure sheet (See Fig. 3) is made out for each scene and indicates the action in relation to the footage allotted to it in terms of screen time. The drawing numbers and any special camera instructions are not yet on the exposure sheet, as these are details that are added by the animator during the graphic production of the scene.

Before actually starting work on the drawings for a new scene or picture,

FIG 2—Animator's original rough extremes of action of Bambi attempting a jump. They represent his idea of the important poses in course of the action. All poses between these extremes were subsequently sketched by an assistant called an "inbetweener."

the animator may sit quietly, deep in thought, and go over the action in his mind—visualizing it as it will ultimately look on the screen. Different animators will approach the animation of a scene in as many different ways: but one generally accepted procedure is to draw a number of small, rough action-poses on a sheet of paper, illustrating the general routine of the idea of the action. Usually, he'll fuss around with the sketches until he develops concrete ideas for present and future animation drawings—in short, until he figures he has the "feel" of the scene. At this point he will start animating—laying out the rough key poses of the action on the working layout.

Animators work with sheets of drawing paper in two sizes—10"x12" and 12½"x15½". The smaller is called a "5 field" paper, the larger, "6½ field." The term "held" indicates the maximum area of the drawing which the camera can cover during the photography step. Along the lower edge of each sheet are five accurately-punched holes which fit pegs on the animator's drawing board, and are for the purpose of insuring accurate registration of all drawings through all stages of the production. Pegs of corresponding size and spacing are also fitted to the inker's tracing boards and on the table top of the animation camera.

The area of the drawing that is covered by the camera in the photography operation ranges from the equivalent of the closeup to a long-shot in live-action photography. Professional animation studios usually have a table of standard field sizes for the guidance of all animators. The fields range from a 2—which covers a very small area of the drawing—to a 6½, which calls for use of the large-size sheets of drawing paper.

Most animated cartoon art work is done on 5 field paper, with the 6½ field paper being used whenever a large set-up is indicated. The latter affords more freedom of action and also lends to the animator's convenience in handling a great many characters in a scene, or in certain complicated setups.

Camera moves are termed "trucks"—after the term "trucking" which is sometimes used instead of the word

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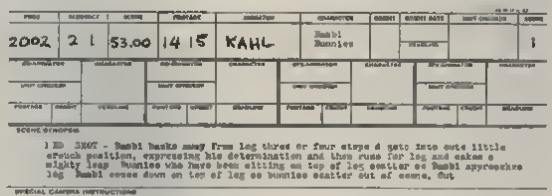
2002
2 1
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Bambi Bunnies
1 ED 3307 - Bambi backs away from leg three or four steps & gets into cute little crouch position, expressing his determination and then runs for leg and makes a mighty leap. Bunnies who have been sitting on top of leg scatter as Bambi approaches leg. Bambi comes down on top of leg as bunnies scatter out of scene. Cut.

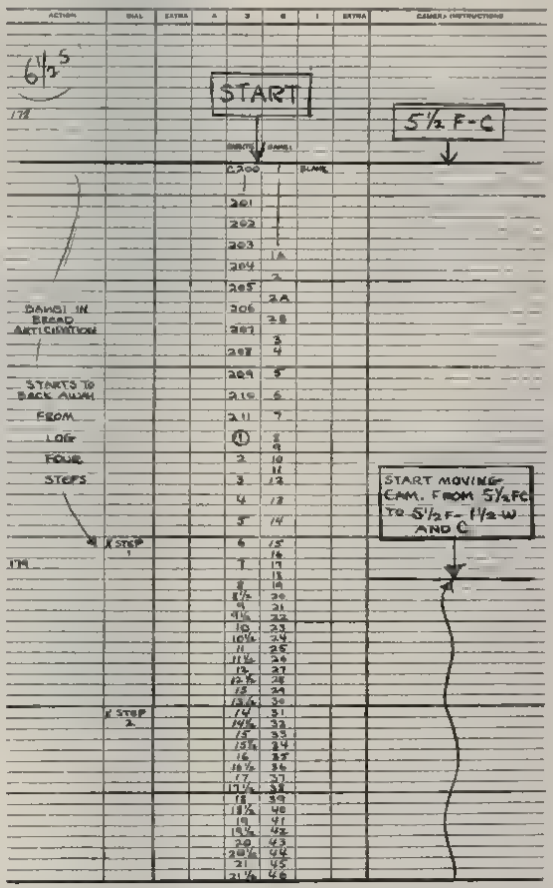

FIG 3—Typical "exposure sheet" on which the animator outlines animation instructions for each scene. On this sheet are instructions relating to the animation of scene from Walt Disney's "Bambi," illustrated here last month. (All illustrations on this page © by Walt Disney Productions.)

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SOUND TRACKS FOR 16MM ANIMATED FILMS

Here's a process that's simpler than recarding live-actian saund in sync and is well within the capabilities af amateur filmers.

By STUART WYNN JONES

NOTE *In a recent issue of* AMATEUR CINE WORLD, *British film maker Stuart Wynn Jones, who claims he could write all he knows about electronics engineering on one frame of 8mm film, described some interesting facts and procedures relative to sound tracks for animated films produced by amateur film makers—an important activity, incidentally, among British amateurs. We are indebted to him and to the publishers of ACW for permission to publish here a condensation of his article* —EDITOR.

OPTICAL SOUND TRACKS for 16mm animated films can be made with equipment which if not already owned by many amateurs is often available through Cine clubs The process is simpler than the recording of live action sync sound, and is well within the capabilities of the amateur cinematographer Briefly, the method is as follows the sound track is recorded on magnetic tape which is then sent to a film laboratory and transferred to optical track This optical soundtrack is then "read" to establish the position of sounds relative to number of frames, and the information is recorded on some form of "dope-sheet" which forms a guide for animation and camera work The visuals are then shot, and the two films — sound track and visual — are given "sync" marks and sent to the laboratory for a "married print"

Magnetic tape recording is a subject which is rapidly developing a literature of its own, and there is not space here to describe in detail the various fascinating methods of messing about with tape The recording of a track for an animated film offers great scope to the ingenious operator of a tape recorder Commentary, effects and music can be arranged and edited on tape with comparative ease It will be an advantage if the sound is arranged in some fairly regular rhythm with clearly defined changes of timbre and volume, as this will not only facilitate track reading, but will also give a rhythmic basis for animation It's also a good idea to insert some easily recognized sound to indicate the position of the first frame of the track This will act as a zero mark for positioning the subsequent sounds It is also advisable to keep some sort of "score" or "script" of the sound track This may be written in musical or verbal notation and should be sufficiently detailed to be referred to when doing the subsequent animation

Where you wish to record music which is covered by copyright, it will be necessary to pay a fee and obtain a license from the Sound Film Music Bureau Ltd., 29 Maddox Street, London W 1, for films made in Great Britain Similar requirements are said to prevail in the U S., also. Certain companies provide mood-music records designed especially for dubbing on to film, and arrangements to use these at favorable rates can be made through the Institute of Amateur Cinematographers

Alternatively, you may prefer to try your hand at "concrete" music mixing which is great fun and doesn't require a license! The track for one notable amateur film was made by recording various sounds on tape and then cutting the tape into short lengths which were re-arranged in rhythmic patterns Only one recorder was used; if you have access to additional recorders and can thus dub sounds in various combinations, there's no limit to the effects you can create.

The completed tape recording is sent to the lab for transfer to 16mm optical track. When instructing the lab, it will be necessary to tell them the speed at which the recording was made, the film speed at which the transfer is to be made and the type of film-stock required

Most labs prefer recordings to be made at 15 i.p.s. but can transfer when necessary from tapes recorded at 7½ i.p.s Recordings should be made on single track only. The normal film speed is 24 f.p.s., but tracks can be laid at 16 f.p.s if, for instance, only commentary

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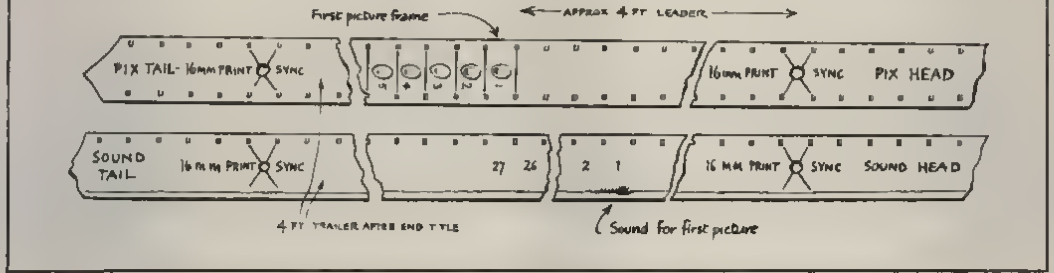

DIAGRAM shows how sound track must be advanced 26 frames for punching 16mm print sync marks

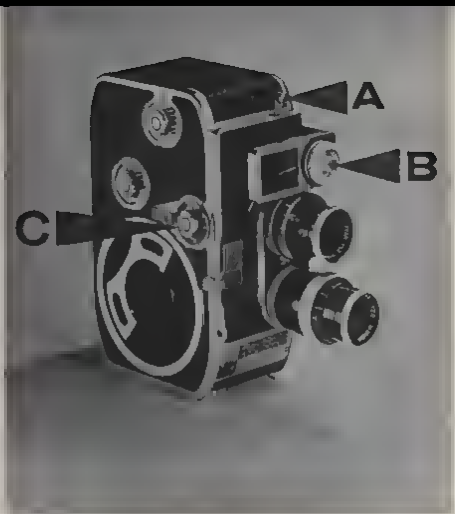

FIG 1—Bolex B-8L 8mm camera with the 20/20 Compumatic exposure calculating system. The built-in photocell is moved into position back of the lens by pushing down lever A. B is the Compumatic control dial and C the control knob for the camera's variable shutter.

LENS-COUPLED EXPOSURE

By ERNST WILDI

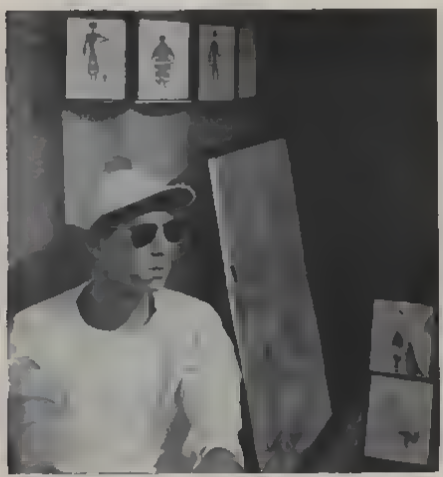

FIG 2—Most movie scenes consist of a variety of shades ranging from white to black and exposure frequently has to be based on a certain area within the scene.

FIG 3—Light backgrounds can unduly influence exposures based on straight meter readings, resulting in substantial under-exposure on subjects in the foreground as shown here.

CINE CAMERAS HAVING built-in exposure meters are not a relatively new development, but the recent introduction of completely automatic 8mm cameras has put this development in the headlines again. Although combining the exposure meter with the camera seems like an ideal and logical solution to the problem of getting consistently accurate exposures, professional cameramen, until now and even veteran amateur movie makers, have shown little interest in this innovation—apparently assuming that a small meter built into a camera will not render exposures sufficiently accurate for their work.

Whether these photographers have ever made practical tests with meter-equipped cameras, I do not know; but if they have, and the results were unsatisfactory, it is likely that the camera and its built-in meter were not used properly. Critical veteran photographers know that the accuracy of any exposure meter depends on the accuracy with which readings are made with it. And when the meter is built into the camera, the danger of careless usage still exists. Too often owners of meter-equipped cine cameras are likely to fall into a habit of setting up the camera and shooting at whatever f/-stop the meter indicates, without considering direction of the light, brightness of the subject or scene, shadows, highlights, and focal-length of the lens used, etc. Little wonder, then, that when the professional learns of the results obtained by such methods, he considers the exposure-controlled

METERS—NEXT FOR PROFESSIONAL CAMERAS?

New innovation makes good exposures easier and surer for cine amateurs. Adapted to professional 35mm motion picture cameras, it could also benefit cinematographers in many fields of film production.

FIG. 4—With the Bolex 20/20 Compumatic system, closeup readings of light falling on main subjects can easily be taken from camera position to achieve correct exposure on subjects, as shown here

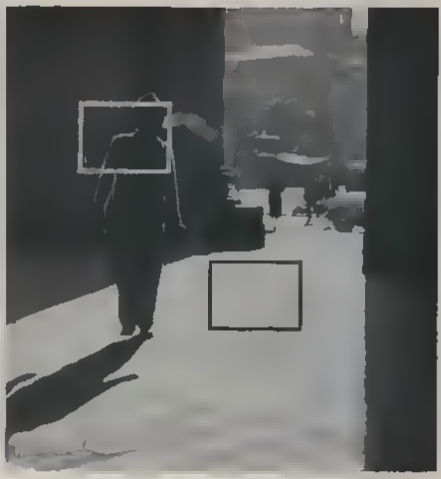

FIG. 5—Correct lighting ratio is easily determined with Compumatic system by taking pin-point readings of lightest and darkest areas in scene, using a telephoto lens.

camera strictly for the amateur

An entirely new development in the field of built-in exposure meters, however, makes it well worth investigating again whether this important photographic development cannot successfully be applied to professional cinematography. This new development in automatic exposure calculation has been incorporated in the new Bolex B 8L 8mm camera and is known as the Bolex 20/20 Compumatic system. Unlike with other systems where the meter functions as a separate part of the camera and controls the lens diaphragm either by mechanical means or by means of low-powered electric current, the exposure meter is an integral part of the Bolex B-8L itself. The meter's photocell is located behind the lens and the rotating turret and functions directly in front of the film, as shown in Fig. 6, page 632. The photocell, therefore, reacts only to the light which passes through the lens and reaches the film to make the exposure. Perfect exposures are assured when the film receives the correct amount of light—and this is what the Bolex Compumatic system does.

In recent years, Hollywood cameramen have shown increasing preference for lenses calibrated in T-stops rather than those calibrated by the older f/-system. The latter are based on the geometrical relationship between the focal length of the lens and the effective diameter of the diaphragm. Not considered is the possible loss of light in the

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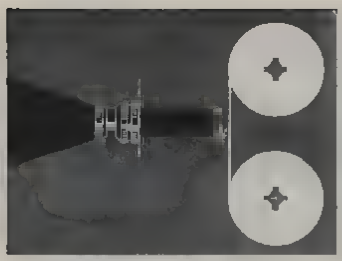

FIG 6—Photocell of the Bolex B-8L Compumatic system is located behind the lens directly in front of the film position, and measures only the light that reaches film

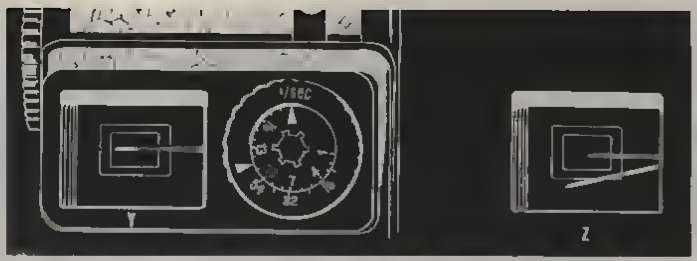

FIG 7—The system's control dial, which is located on front of the camera next to the finder window, is set according to speed of film used, shutter opening and camera speed. Thereafter it is only necessary to close lens diaphragm until both indicators are parallel, as shown at Y. Unadjusted indicator needle is shown at Z above, right

lens itself through reflections and absorption or differences caused by mechanical tolerances in the lens diaphragm.

On the other hand, with T-stop calibrated lenses, photographers are assured that each lens, regardless of make or focal length, will transmit the same amount of light at a given T-stop. This is because the stops have been determined on the basis of actual light transmission of the lens—measured by a photocell mounted behind it. The Bolex 20/20 Compumatic system is based on exactly the same principle and as a result exposures made with the Bolex B-8L 8mm camera will be of T-stop accuracy without having to use T-stop lenses.

The Compumatic system has far more important advantages than simply taking into consideration differences in light transmission. Motion picture photographers invariably use a wide range of lenses of various focal lengths, from extreme wide-angle that takes in a field of view as much as 50° to long telephotos having an angle of view less than 5°.

The acceptance angle of an ordinary photoelectric exposure meter, including those built into cameras, is fixed and generally approximates the angle of view of the normal taking lens of the camera. When wide-angle or telephotos are used, the exposure meter still measures the light with the same acceptance angle—although, in the case where a telephoto is used, the small area included in a telephoto shot may be of an entirely different brightness than the large area measured by the meter. Thus, in order to obtain a more accurate light reading of that small area, the photographer must take a reading close up, which is frequently impractical or impossible because telephoto lenses are mostly used when the photographer, for some reason, cannot or does not wish to approach the subject. The Bolex 20/20 compumatic system overcomes this problem effectively and allows that which even a separate exposure meter cannot—namely, pinpoint exposure readings of small and distant areas *by simply making the reading with the telephoto lens in place.*

Such pinpoint readings have important applications in the professional field, both outdoors and in the studio, where the creative use of side or back lighting can greatly enhance the pictorial quality of a scene. In black-and-white cinematography mood is established and sustained by the creative use of shadows and highlights, and exposures may have to be based on one or the other. Pinpoint exposure readings, made through the telephoto lens, can serve to determine the brightness ratio between highlights and shadows. Since the professional cinematographer makes extensive use of backlighting, he will also appreciate the fact that the photocell in the Bolex camera is not hit by direct light, as in the case of a detached meter, and therefore not subject to false light readings. A motion picture camera incorporating the built-in exposure meter system of the Bolex B-8L retains the full advantages of interchangeability of prime lenses, where it has a standard lens mount, because the lenses are not mechanically coupled to the meter in any way. Such a camera could be equipped with a zoom-type lens and even anamorphic wide screen lenses, and correct exposure readings would be assured for either type lens at all f/-stops because the meter *reads* the light coming through the lens to the film.

The superiority of the system becomes even more evident when filters or extension tubes are used. How does a photographer arrive at the correct f/-stop when using these accessories? Only by calculating the stop on the basis of the filter or extension tube factor. With the Bolex Compumatic system, any light loss induced by use of filter or extension tube requires no extra consideration by the photographer and therefore involves no manual exposure adjustment as when other cameras are used. This is because with the Bolex B-8L, the photocell of the built-in meter measures the light *after* it has passed through the filter or extension tube and subsequently the lens and reaches the photocell with its intensity already diminished by the lens accessory used. The meter, then, measures exactly the light reaching the film.

In addition to subject brightness, three other factors affect exposures: the sensitivity of the film used, camera speed, and shutter opening used. All these are fully taken into account in the Bolex B-8L's automatic exposure system. Its meter indicates correct exposure for all films with sensitivities ranging from ASA 10 to ASA 80, and for camera speeds from 12 to 64 frames per second. The camera is also equipped with a true variable shutter, adjustable from zero to 150°, and which can be locked in two fixed positions—half and fully open.

How does the Bolex Compumatic system work? A tiny, extremely sensitive selenium photo electric cell is located between the rotating shutter and the two-lens turret. It is moved in front of the film aperture by simply pushing down on a lever (A Fig 1). By opening or closing the lens diaphragm, the photocell receives more or less light, thereby activating a needle visible in the viewfinder (Fig 7). The lens stop is correctly set for a given scene and light condition when this needle is lined up behind a stationary indicator, as shown at "Y" in Fig. 7. The latter is connected with what might be termed the "control board" of the camera which consists of a dial which is set for sensitivity of film used, camera speed, and variable shutter opening. The moment the release button on the camera is pressed, the photocell automatically moves out of position in front of the film.

Although the B-8L is an ideal camera for all beginners, it was not specifically

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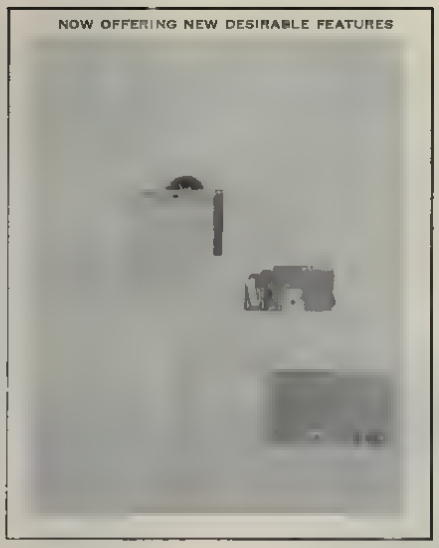

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The Film Voted "Best of 1958" At Brussels

Rated one of the most technically interesting films of recent years, "An Invention of Destruction" combines live actors, puppets and animation

By ALINE MOSBY

A FLYING MACHINE, looking exactly like an old drawing in an 1880 Jules Verne novel, comes to life and whisks across the movie screen automobiles puff steam . . a weird submarine with webbed "feet" paddles through the ocean . . a scientist works at a monstrous machine with so many wonderful contraptions that the audience breaks into applause

Such are the scenes from a Czechoslovakian motion picture that won the title of Best Film of 1958 at the World Film Festival at the Brussels Exposition this summer

It is "An Invention of Destruction," adapted from a Jules Verne novel, and one of the most technically interesting films in recent years—a combination of live actors, cartoons and puppets

"An Invention of Destruction" probably could have been made only by the Czechs—the clever, patient artisans who long have reigned supreme in the field of puppet films.

The director of this fascinating, prize-winning film was Karel Zeman, an animator, designer and director of Czech puppet films almost since their inception. His idea was to make a Jules Verne movie in the spirit and style of the original novels.

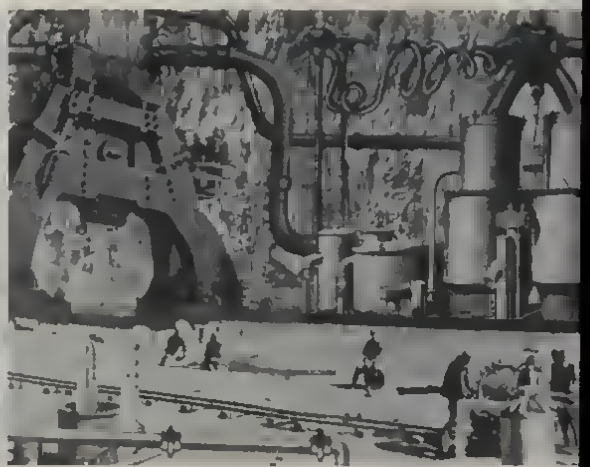
KAREL ZEMAN, Veteran animator, designer and producer of Czech puppet films directed the Jules Verne-ish "Invention of Destruction."

Imagine, if you can remember them, the drawings in the Verne books—woodcuts and etchings criss-crossed with tiny horizontal lines, showing fantastic cannons, submarines, balloons and other "fantasies" of what was to come in the future. That, exactly, is "An Invention of Destruction", frame-by-frame

Zeman first assembled a vast collection of the works of French painters, Bennett and Riou, who illustrated the first editions of the Verne books The design of the film—the sets, the costumes, the props and wonderful machines—was copied faithfully from those drawings.

The story is adapted from the Verne novel, "Face Au Drapeau," the same story said to have inspired Walt Disney's American version, "Twenty Thousand Leagues Under the Sea"

THE "NAUTILUS" is a plastic puppet miniature. The fish and part of the background are animated drawings All artwork was done in the style of old black-and-white etchings or woodcut illustrations.



BACKGROUND, machinery, etc., are drawings with moving parts animated The actors are live and were superimposed over the background by unique methods of traveling matte and optical printing.

Live actors portray the characters. But the scenery, the backgrounds and the machines in the Czech film are sometimes cartoons, and sometimes little "puppet" models that move via the familiar method of single-frame photography—the cinematographer moving the model a fraction of an inch, photographing it, moving the model again, and repeating the process.

For "An Invention of Destruction" cinematographer Jeri Tarantik photographed each scene with a piece of glass on which had been drawn fine horizontal lines mounted before the camera lens. The result is the curious, intriguing effect of looking at the old black-and-white etchings and woodcuts come to life.

This complicated marriage of live-action drawings and puppet-like models meant that the same film often went through the camera three and four times. For example, for some scenes cartoons were first drawn of the outdoor backgrounds. Then a weird, 12-propellor flying machine—actually a two foot long plastic miniature—was photographed via the puppet stop-action method, superimposed over the same film. Then live actors, filmed in appropriate perspective, went through their paces, and this was superimposed again over the drawings and puppet-type miniatures.

For some scenes, full-size (but not practical) Verne machines had to be built. For most of the scenes the submarine "Nautilus" is a plastic model, photographed via the puppet "stop-action" method as it "moves" through the sea. The underwater mountains, canyons, strange fish and sea creatures were drawn in the animated cartoon method. When Zeman cut to closeups of live actors climbing out of the submarine, a prop section of a full-size, stationary model was used.

The underwater scenes, incidentally, were photographed "dry." The water effect is trick photography. And the deep sea actors move slowly, as if moving through water, because they were suspended by wires attached to their diving costumes while the camera was set for slow motion photography.

Another touch that gives the film the feeling of the old Verne etchings is the scenery used for many of the shots of live actors, which consisted of walls, props, buildings, etc., painted on paper or wood in the exaggerated manner of the ancient drawings.

The story of "An Invention of Destruction" is the familiar tale of the scientist, Thomas Roch, who has invented a new explosive. He plans it for peaceful uses, to take the place of coal and oil. But a pirate kidnaps him and his assistant, Simon Hart, and takes him by submarine to an island formed in the ocean in the hollow of a volcano. The pirate, posing as Dr. Artigas, a patron of scientists, provides Roch with a laboratory in which to finish his invention—allegedly in the interests of humanity.

The assistant, Hart, soon discovers the villain plans to conquer the world. The scientist, too, at last sees the light and blows the island laboratory, the invention, the pirates and himself to pieces rather than have the explosive used for war. At the last minute Hart and a young girl escape from the island in a balloon.

A modern touch was given to the ending when the explosion, executed via animation, resembles an atomic bomb blast. As the young hero, Hart, tries to flee from the island, a guardian of the fortress, a mammoth eagle, tries to destroy him. This led some observers at the film's showing at the Brussels World Film Festival to wonder if the Czechs had the U.S., as symbolized by an eagle, in mind as the "villain" who wants to use the bomb for war.

But Zeman, in an interview for the *American Cinematographer*, pointed out that the eagle was mentioned in the original Verne novel as a symbol of Napoleon. He says he meant the eagle to stand for a flying machine because "I wanted to free this idea from elements of nationalism."

"It was Verne's idea that there was a possibility to discover an invention which might be dangerous for all mankind," the director explains. "But it was Verne's idea, too, that the whole world had to unite against this danger. This was written 80 years ago in 'Face au Drapeau'. I have tried to do my best to keep the true spirit of Verne's work in "An Invention Of Destruction."

"It has ever been my wish to make a good Verne picture, but nothing else, as a remembrance of adventurous reading of our time of youth. This picture came from the bottom of my heart. I am fond of his stories. Verne was a great cosmopolitan humanist and he wrote his books for the whole world. I had the same idea—to do a picture for all the world."

Many efforts have been made by others over the years at capturing the Verne spirit and bringing it to the screen, beginning with George Melies'.

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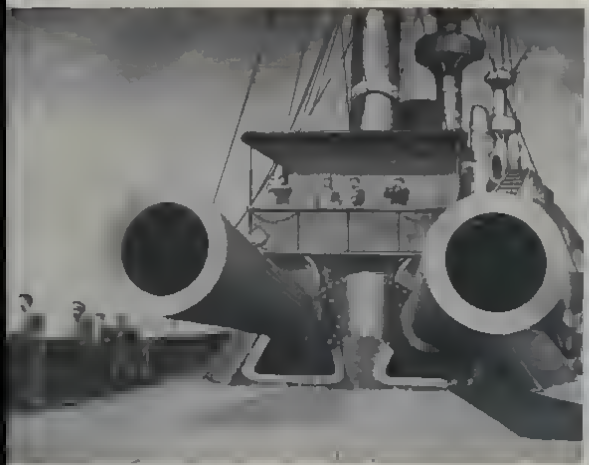

THE PIRATE SHIP—made of wood and paper and painted in the style of the original etchings that illustrated old-time books of Jules Verne. Here, again, actors are live, photographed in proper perspective.

FOR THIS DEEP SEA scene, the background is animation art work. The monster is a miniature puppet ingeniously manipulated to simulate real-life action. The diver (center) is a live actor, superimposed.

Do-It-Yourself Sound Recording

Part One: Recording The Narrative Track

By ALLEN JACOBS
Director of Sound Recording, The Calvin Co., Inc.

ADVENT OF MAGNETIC tape and film recorders has made it a simple matter for the 16mm film producer to do his own voice recording, including the final mix. (Photo courtesy Kamen Advertising Agency, Houston, Texas.)

RECORDING THE narrator's voice for motion picture sound tracks used to be the exclusive job of the professional recording studio. In time, a few intrepid producers attempted recording on discs. Still others attempted photographic (optical) track recording. Now, with the coming of magnetic sound recording devices many industrial film producers and film producing units in major industry are doing their own voice recording—including the final mix.

Today, anyone with a few hundred to a few thousand dollars can set up to do magnetic sound recording for films. But as in any other phase of film making, there are a number of things that must be mastered in order to do a creditable job.

Narrative voice recording involves:

1. Equipment
2. Method
3. Production

The equipment may be a quarter-inch tape recorder, sprocket-hole film recorder, or a magnetic-optical projector-recorder. We'll discuss the pros and cons of the various types of equipment in another article. For our immediate purposes, we'll limit the equipment discussion to pointing out that

a. There are various levels of cost and quality, with some direct relationship. Better equipment makes possible better sound, up to a practical point of diminishing returns.
b. Recorded sound can be no better than what goes into the microphone and what the mike can pass. (This also involves acoustics.)
c. It's necessary to have some method of interlocking recorder and projector (on which the workprint is run) in order to maintain the desired relationship of words and pictures when the voice is recorded against the projected picture.

There are two basic methods of recording words to be fitted against pictures. One is to project the edited workprint and read the narration against it. The other is to record the narrative paragraphs wild, and then match them against the workprint in the editing process. There are arguments both ways.

A continuous reading against projected workprint (with sufficient rehearsal) combines recording and voice editing in one operation; when you finish, the words are where you want them. Also, there is very little danger of the mood or pace varying from line to line except as you want it to. And you determine as you go that the spoken words will fit within the footage where they belong.

At the Calvin Company we use both methods. We normally record voice against the projected picture, unless the cueing is intricate and the placing of words very critical.

When we record against workprint, we prefer to have the narrator see the film at least one time. Then, we utilize a staff man or the producer's representative—or whoever is most familiar with the edited film—to cue the narrator. We use both the standard visible cues, as used in radio and television work, and arm or shoulder pressure cues—whichever the narrator is accustomed to.

For the benefit of the many industrial, TV film, and in plant 16mm film producers who are clients of The Calvin Company, Inc., Kansas City, Mo., Allen Jacobs, the company's Director of Sound Recording, has written a series of articles on sound recording for publication in The Aperture, workshop publication for 16mm film producers issued monthly by The Calvin Company. Purpose is to acquaint the small independent film producer with the rudiments of and equipment for recording sound for his own 16mm productions.

Because American Cinematographer numbers many readers on this level of professional film production, and because its editors feel that Jacobs's articles can benefit many of these readers, we are reprinting the series, beginning in this issue, with permission of The Calvin Company.

Because of his extensive sound engineering background and his long experience in dealing with the sound problems of the many 16mm film producers who are Calvin clients, Allen Jacobs is eminently qualified to speak and write on his subject.

Article II in the series will appear in our November issue.—EDITOR

We've also used signal lights for the narrator, but we've found that the personal cues have worked better for us.

With a reading stand in front of him, we have our narrator face the screen on which the picture is to be projected. Then the mike is adjusted to the narrator's height, speaking volume, etc.

Some of the mechanics involved in getting ready to record are:

1. *Final script approval.* Even though additional minor changes may be made in the script at the time of recording it's advisable to hold up the narrator call until the script has been approved. Sitting in on several hours of tail-end script revision seldom improves the narrator's delivery.

2. *Typed script.* Most narrators do a better job of reading if they don't have the unnecessary hurdle of pasted-up, smudged, and otherwise hard-to-read scripts.

3. *Workprint ready.* We try to avoid the nuisance of workprint splices breaking during the recording session. The time taken to double-check (and to remake poor) splices is time well spent.

4. *Equipment ready.* It's frustrating, when it comes time to record, to find that there is some bug in the recorder, the mike is acting up, the reading stand isn't right, etc., etc., etc. No one will argue that it's a good idea to have all equipment ready, checked out, and standing by in advance of the recording session.

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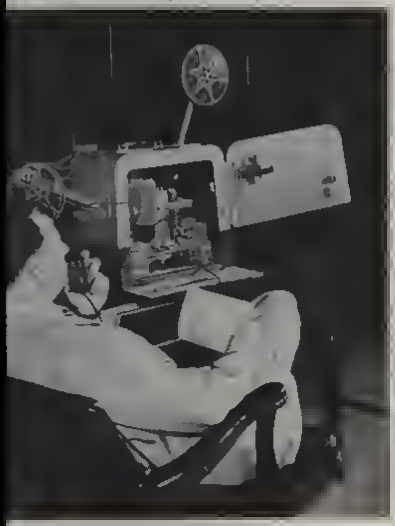
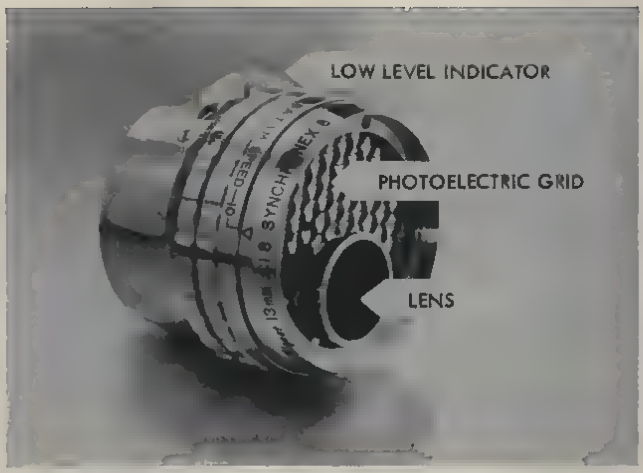
THE MAGNETIC-OPTICAL recorder-projector is an excellent machine for a number of specialized purposes, one of which is the direct post-recording of sound on sound-striped release prints





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INDICATAIVE OF THE progress that has been made in the science of automatic and semi-automatic exposure control for motion picture cameras is a lens developed by Elgeet Optical Company, Rochester, N. Y., having a fully automatic photo-electric controlled iris.

Trade-named the Synchronex, it is said to be the first fully-automatic interchangeable lens for cine photography. Designed to fit most 8mm D-mount single lens cameras, the unit is considered one of the most advanced approaches to automation in cinematography in recent years.

The lens-meter combination is compactly assembled in a conventional-appearing lens housing, as pictured above. The lens itself—an f/1.8 13mm—extends through the photo-electric meter component and is surrounded by its honeycomb grid at the front, through which light reaches the meter's selenium cell.

The iris of the Synchronex, like that of the human eye, enlarges or contracts, depending upon the intensity of the light—i.e., it opens or closes automatically to compensate for the change in light encountered in different camera setups or those induced when moving clouds alter intensity of the light falling on a scene while photography is in progress.

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(Continued on Page 648)

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A FLASH OF TOMORROW

(Continued from Page 623)

into place, it was decided to photograph this operation in reverse, with the first exposure showing the chassis completely assembled and continuing until each part or component had been removed. On the screen, of course, the action is reversed and in proper order." (In the photographic operation, the negative film load was placed in the takeup instead of the supply chamber of the magazine, then the procedure photographed with the camera operating in reverse).

"We measured the total distance the dolly had to travel," said Mohr," then calculated the amount of movement between takes on the basis of the number of frames of film in 14 seconds—the time alloted for the shot, as previously noted The answer was $\frac{5}{8}$ of an inch. I had a tape affixed to the floor alongside the dolly tracks and marked off in $\frac{5}{8}$-inch segments. Then a pointer was mounted on the dolly and bent so it would reach down to the marked tape. This served as a guide for the dolly operator and enabled him to precisely advance, then stop, the dolly between takes Before we proceeded to the next position, I checked off the last position on the script to make sure we would neither miss a mark nor duplicate one.

"We struck a pattern of procedure early where I'd call out to Harry Wolf, my camera operator: 'Expose one frame, Harry,' then the dolly operator would advance the dolly and I'd repeat the instruction again and again until the entire operation had been photographed. The exacting, tedious procedure required about three hours to shoot, and it left the crew a tired, slaphappy lot!

"The next phase of the photography concentrated on pointing up the color of the car, at the same time incorporating a glimpse of the Color Department of GM's Styling Building—an ultra-modern and most fabulous structure of advanced design. Glamor is the hyword here, and glamorous, indeed, are the names given to the rich and lustrous colors conceived especially for Firebird III—*Lunar Dust*, a combination of gold and platinum with a crystal clear luster for the body, and *Crater Red* for the trim All this was enhanced to the utmost with careful lighting aided by color temperature meter readings to insure maximum fidelity in the hues."

Eastman Color negative affords such wide latitude for printing control, Mohr pointed out, that for most shots it was unnecessary to be too specific about color temperature However, he executed one outstanding shot where color temperature readings were imperative, and it was here that he made good use of a General Electric color temperature meter. "The shot had to do with pointing up a technical development in the car's acceleration, and this required photographing the flame of the gas turbine as seen through one of the engine's ports," Mohr explained. "Purpose of the shot was to show the change that takes place in the character of the flame as fuel is added during normal acceleration For proper orientation, I had to show part of the port exterior. To achieve the desired result, I decided to make two separate shots which later could be dissolved together to convey the desired effect.

"For the first shot I used white light of 3200° Kelvin to illuminate the turbine exterior For the subsequent shot, which shows the turbine flame reacting to added fuel, I lit the turbine exterior with blue light having a color temperature of around 6000° Kelvin, and with the aid of my exposure meter I then adjusted the lighting to the identical exposure value I had for the previous shot.

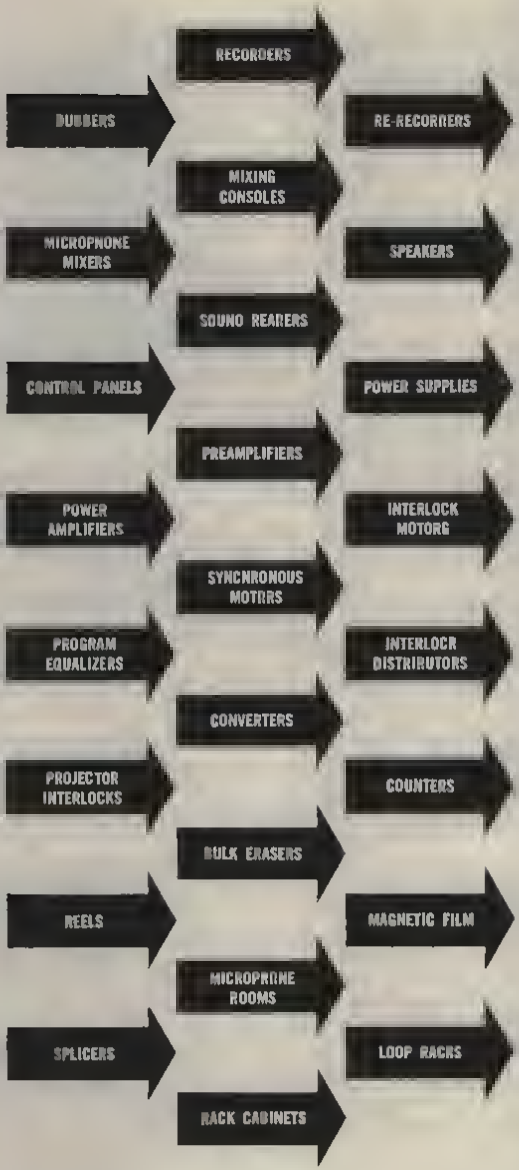
Thus, when both shots were joined together in the dissolve, only the color and character of the flame inside the turbine were changed. The laboratory was instructed to print the first shot in a normal manner, and the second shot in what is termed 'minus blue,' so that the exterior of the turbine in both shots would be uniform in color."

In still other shots, Mohr explained he employed light dissolves—from blue to red and vice versa—for which his color temperature meter came in very handy. The color dissolves were effected with shutters mounted on the set lamps The electricians were trained to sync their shutter operations to achieve the utmost smoothness in the dissolves

Perhaps what might be considered the highlight shot of all those filmed in Detroit had to do with demonstrating the simplicity of the unique Unicontrol of the Firebird III—the car's most significant single feature. The wing shaped Unicontrol handle is mounted atop a four-inch control stick located in the center of the car and is easily operated by either passenger It combines all steering, braking, accelerating and parking functions.

"The script called for a driver's eye-view from inside the plastic canopy of the driver compartment, as he maneuvers the Unicontrol," Mohr said "To produce this, we had a sturdy camera platform built and mounted on the front of a station wagon. The Technirama camera was mounted low so it would take in a mockup of the Unicontrol, which was mounted on a stanchion at the correct height and at the proper distance from the camera, so that the control and the driver's hand operating it would be in full view in the foreground.

"We chose the smooth, paved streets threading through the grounds of the



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Technical Center to stage this shot. As the station wagon was driven at a moderate pace—turning corners, stopping, backing up, etc.—the driver's hand operated the Unicontrol in full synchronism with the car's movements in a manner to make it appear responding to the driver's operation of it. Here the wide-frame of the Technirama system proved its real worth—particularly when a wide-angle lens is on the camera—as it encompassed a wide range of scene area with the foreground objects always in sharp focus.

"This shot was made with a 35mm lens on the camera—equivalent to about a 17mm on a Mitchell—and because we had very good light that day, I was able to stop down to about f/9. By splitting the focus through the camera—i.e., with the ability to look through the camera onto a ground glass and focus visually—it was possible to hold the background in absolute focus along with the foreground objects. In a Hollywood production, a shot of this kind would generally be made by traveling matte process."

This terminated the Detroit phase of the assignment for Hal Mohr and his camera crew, who until now had been concerned chiefly with chronicling where and how the Firebird III was created. The closing sequences of the picture, which were to show the completed car in action on the road, were to be filmed at General Motors' Desert Proving Ground at Mesa, Arizona. A ten-day interval ensued during which time the Firebird III was rushed to completion and shipped overland by van to Arizona.

"When I left Detroit for Mesa, the car virtually was still on the drawing boards," said Mohr. "The speed with which it was put together and placed aboard the van for shipment is just one of the amazing feats which is typical of the accomplishments of General Motors' Engineering Department."

"The day I arrived in Mesa," Mohr continued, "the Firebird arrived also and was made ready for the cameras, following a number of tests and some few changes in its complicated and highly sensitive electronic and mechanical components. Until now, the car had never been driven any appreciable distance except for the few yards necessary to placing it aboard the van in Detroit for shipment west."

For a particularly important traveling shot of the car in motion as it sped down a 2½-mile straightaway on the Proving Ground, a special camera platform designed by GM engineers was mounted on the rear deck of the Firebird III (See cover photo). "We traveled about 75 miles per hour," said Mohr, "and undercranked the camera

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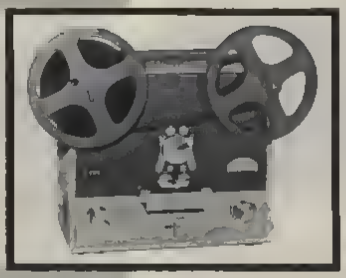

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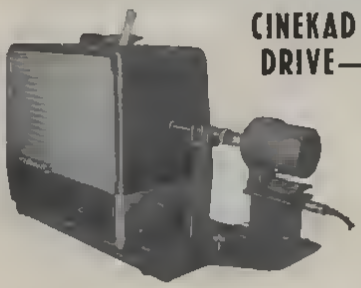

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slightly to produce the illusion of still higher speed We used a 28mm lens on the Technirama double frame camera—equivalent to about a 14mm lens on a Mitchell—and this was in focus to infinity."

For other moving camera shots, Mohr used a camera car of the type used by Hollywood studios for chase scenes, and which was supplied and operated by Ed Fuller of Hollywood

Both in Detroit and at the Mesa proving ground, Mohr had the benefit of dailies Each day's exposed Eastman Color negative was shipped to Technicolor's laboratory in Hollywood at the conclusion of shooting Technicolor telephoned reports on quality daily and followed up the reports the next day with prints

Throughout the whole production, photographers from General Motors Photographic, the company's graphic arts division, worked alongside Mohr and his Technirama crew, photographing in 16mm and in 35mm footage of the Firebird III development for purposes other than the Motorama show These included an informational film for General Motors dealers and a technical record film. At one time during the Proving Ground phase of photography, there was mounted on the camera car—in addition to the Technirama camera—three other cameras manned by General Motors Photographic cameramen

Besides Mohr and his camera crew, General Motors sent 23 men from its Research Department, 9 from its Styling Division, plus 15 others to its Desert Proving Ground at Mesa, Arizona for the unveiling, road-testing and photography of Firebird III—augmenting some 60 technical personnel normally based there

"Imagination in Motion" began when General Motors commissioned the Campbell-Ewald advertising agency to conceive and produce its 1958 Motorama show The agency in turn placed the actual show production, including the 6-minute film, in the hands of Maurice Evans, Inc., New York, for execution A number of industrial film producers plus General Motors' own photographic division were asked to bid on production of the film General Motors Photographic was the successful bidder. Mike Omalev, superintendent of film production at GMP, specified wide-screen and color for the production, and a veteran director of photography to shoot it. Hal Mohr, from Hollywood, was selected for the job, and Harry Wolf, who had worked on previous Motorama films, went along with him as operative cameraman and Technicolor technician. The rest of the production personnel—grips, assistant cameramen, and electricians—were supplied by General Motors Photographic, both at Detroit and later at Mesa, Arizona Robert McLean, in

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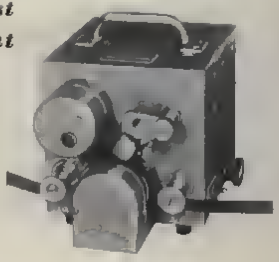

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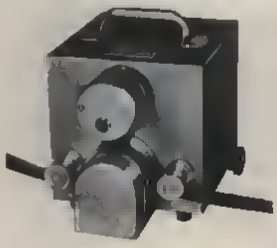

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charge of the entire Firebird fIf project, and working directly under GM Vice President Harley Earle. worked closely with the film production unit.

Mohr shot between 15,000 and 16,000 feet of Eastman Color negative, which was processed by Technicolor Corporation and printed down to standard 35mm from the Technirama double-frame negative This product of 4 weeks shooting was then edited and the sound recorded and added at General Motors Photographic for the 6-minute film now being screened at the Motorama show.

"So interesting is this Firebird III and so spectacular is it both in innovation and performance," Mohr said, "its a pity a 60-minute version cannot he put together for showing in theatres." ■

"A NIGHT TO REMEMBER"

(Continued from Page 620)

"It was simple enough for me," he said, "but it presented the wardrobe department with a lot of headaches All the uniforms had to button over the opposite way, medal ribbons bad to be switched, feathers in women's hats changed over and so on. And on the set everyone had to salute left-handed, shake hands left-handed Luckily there weren't too many starboard scenes."

Every interior in the film had a ceiling, including tbe great dining room, lounge and even the staircase. On top of that every set bad to tilt as the liner listed more and more. One set tilted as much as 45 degrees. Spots had to be fixed to the sets to tilt with them.

"There's only one camera tilt in the film," Unsworth told me "People don't lean against a camera tilt enough. It's almost impossible to give the same effect.

"The only special effects in the film occur in the sequences when the survivors in the boats are seen with the sinking *Titanic* in the background We used traveling matte for this. The continuity shots of the ship steaming along are models, of course, and so is the shot of her going under.

"The crowd scenes in the pre-credit launching sequence come from old newsreels of launchings, and the shots of the ship leaving Southampton are stretch-printed 1912 news sbots."

Locations included Ruislip Lido, where all the scenes of survivors in boats were shot on the great lake, and Glasgow, Scotland, where boat-lowering sequences were filmed on tbe Clyde against a half-demolished ship. All these scenes were filmed at night in mid-winter, and the actors—particularly the stunt men—suffered bitterly.

"I had to think of a fresh approach to most scenes," said Unsworth. "I couldn't start with a key light and add to it. For most shots there couldn't be a key light. There was no moon the night the *Titanic* went down, so f had to aim for a starlight effect. The people struggling in the water and the boat survivors all had to be lit sufficiently well for them to be seen, and yet there was no logical source for the lights.

"On the ship's bridge I had no lights in front of the actors. Shooting on the lake f couldn't use the usual low back-light effect. fn effect f had to try and disguise the fact that the scenes were lit at all! Eventually I got a soft, overall effect which served the purpose.

"The ceilings often made key lights impossible to use in interiors, too The most uncomfortable interior was the boiler room sequence, when we were shooting up to our armoits in water. Incidentally, I discovered you can use lamps under water. providing you switch them on below, and I did this when f wanted to stress tbe depth looking down into sunken corridors."

One terrifying series of shots looks down the deck of the *Titanic* as it slides below the surface, carrying dozens of struggling people with it Again the practical problems for Unsworth in tbis studio tank were considerable.

Mitchell cameras with the new Series ff lenses and Eastman Kodak Plus-X negative were used. Unsworth admits that he prefers shooting in color.

"But of course "A Night to Remember" had to he monochrome" he said. "It's obviously a black-and-white subject. I tried to avoid artiness throughout The camera had to reflect the realism of the situation. In fact when I saw that 1912 newsreel, I was so moved by the grainy, jerky scenes of people waving goodbye to the doomed ship, I suggested that we could shoot the film in something approaching the same way, with deliberate lack of definition and so on to capture the authentic feel of the period. But it was felt that audiences might not accept this."

Goeffrey Unsworth's current film, "The Freshman," starring Hardy Kruger and Sylvia Syms, is in complete contrast to "A Night to Remember" I talked to him on a tiny Beaconsfield set representing a Cambridge University student's room. A complicated trick shot was in progress As the camera panned from Kruger at a desk to an empty bookshelf, books jumped into place The camera tilted to the fireplace, and the fire lit itself. The camera tracked back, and glasses and books appeared on a foreground table. Another tilt up and Kruger reappeared, now in conversation with Sylvia Syms. The trick effects suggested the time that had passed since Kruger moved in to his room.

The whole shot took most of the day, with technicians whipping props into position between camera breaks and tucking furniture under the dolly wheels. "I'll be glad when we've finished with this poky set," admitted Unsworth.

It was evident tbat he is happiest when working on a more challenging type of production. "A Night To Remember" was replete with opportunities for Unsworth to explore new ideas in lighting and camera maneuvers. And his work on tbis picture shows he made the best of the opportunities. ■

SOUND FOR ANIMATED FILMS

(Continued from Page 629)

is required and the lower sound quality at this film speed is acceptable The labs. however, usually charge more for making transfers at the slower speed.

The *type* of film stock to be used will, of course, depend on the type which is to be used for the visuals. ff you're going to shoot your picture on Kodachrome you'll need a *reversal* sound track so that the two can be combined in the final married print. If you're using neg-pos., you'll want a *negative* sound track If the track is likely to require a good deal of reading—and this will be the case with most cartoons where there are many carefully synchronized sounds—it is advisable to ask the lab to supply a duplicate of the optical track You will then be able to treat this dupe quite roughly when reading it, and can scratch, mark, chop and chew it up with an easy conscience, knowing that the master optical track is safely in its pristine paper packet.

This transfer from tape to reversal optical track will cost from £13-£16 per 400 ft. at 24 f p s At 16 f p.s the cost is £15-£17 per 400 ft The duplicate sound track will cost about £8 per 400 ft. Prices for negative track are slightly less. Now perhaps you'll learn to make it short and snappy!

(NOTE: The cost for transferring sound from quarter-inch tape to reversal optical track is roughly around 7¢ per film foot at 24 f.p.s., according to one major sound laboratory in Hollywood Few laboratories in the U. S. offer sound transfer to film for 16 f.p.s speed. The duplicate sound track will cost around $16 to $18 per 400 feet. Prices for negative track. where electro-printing is employed, runs around 2¢ per film foot—ED.)

The transferred sound track can be "read" by running it through a sound-film projector in the normal way and tapping it in the blank picture area with a chinagraph (grease) pencil where it passes over the sound-head as each required sound is heard. This leaves a

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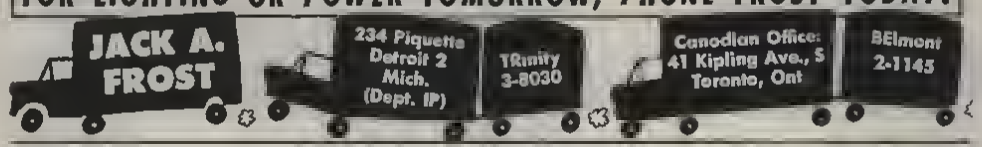

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mark on the film which shows the position of the sound. With a little experience, a closer estimate of the exact position can be arrived at by visual examination of the track. Clear cut changes of note or timbre are easily seen.

The process of marking the film is made easier if you can beg, borrow or steal a projector which is capable of being run in reverse. In certain cases it may be easier to read portions of the track by pulling the film over the sound-head by hand. The various chinagraph marks on the film can be given reference numbers to identify them and these numbers should also be put on the score or script.

The *dope-sheet* was described in *A C W.* for July, 1958. It is a frame-by-frame plan of the film. In order to draw it up, one must count the frames of the optical sound track and then mark the position of the relevant sounds by the correct frame on the dope sheet. Perhaps no mechanical frame-counter is available. Mechanical wizards can conjure one up from a few spare sprocket wheels and bits of a broken bicycle; but for the majority of us it is easier to draw a scale on the edge of a piece of card about 100 frames in length, and use this to mark the film with a chinagraph pencil at 10-

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Bargains In Used Equipment On Page 652-3.

frame intervals. The completed dope sheet becomes the guide for animation and camera work.

When the visuals have come back from processing you can now have the thrill of a *double-headed run*. This simply means that you project the separate picture and sound-track films in one projector. The picture film runs from the usual supply reel through the top sprocket, gate and lower sprocket, and is then allowed to fall into a cloth-lined bin. The belt driving the take-up reel is disconnected and the sound track runs from this reel, through the lower sprocket, around the sound-head and subsequent sprockets and also falls into the bin.

The first frame of the sound track must pass over the sound-head as the first frame of the picture film passes through the gate. This position is given when the sound film is placed 26 frames in advance of the picture film. The films can then be projected to test sync. Some variations of the above method may be required to suit different projectors.

Before the two master films are sent to the lab for a married print, they must be given *sync. marks* on the leader and trailer at head and tail respectively. It is usual to scratch two diagonal lines and punch a hole through the frame areas of both films and mark them either *Level Sync.* (i.e., when sound and visual are placed side by side) or preferably as 16mm *Print Sync.* (i.e., when sound track is advanced by 26 frames). The two films can then be sent to the lab for a married print. ■

VOTED BEST AT BRUSSELS

(Continued from Page 635)

amusing French "Trip to the Moon" a half century ago. Hollywood has made two versions of "Twenty Thousand Leagues Under the Sea" first in 1916, and the more recent Disney version starring Kirk Douglas and James Mason.

Hollywood also made "The Czar's Courier" in 1908; France re-made that story last year with German star Curt Jurgens in the leading role. France in 1913 and Russia in 1936 filmed "The Children of Captain Grant." "Around the World in 80 Days" is a current Hollywood hit all over the globe; the Germans made it twice before.

"An Invention of Destruction" looks the most Verne-ish of all. Some observers at the premiere in Brussels felt the highly stylized method became tiring after an hour, but that is beside the point. The film is, indeed, a noteworthy work of cinema art and technically an astounding contribution to cinematography. It certainly is proof of Czech mastery in the puppet-cartoon-live action field.

Director Zeman has an impressive background in films. He has designed and directed many puppet films and since 1945 has been head of the Puppet Film Studios in Gottwaldov, Czechoslovakia. He combined live action and puppets in "The Christmas Dream." Through the "stop-action" method he brought glass figures to life in "Inspiration." His "Journey Into Primeval Times" combined puppets, live actors and trick techniques. Since World War II Zeman's puppet-live action movies have won many prizes at international film festivals.

It took Zeman a year-and-a-half to make the troublesome, backbreaking "An Invention of Destruction" at Gottwaldov. Zeman and Frantisek Hrubin wrote the script. The miniatures were made by Zdenek Rozkopal and the montages by Zdenek Stehlik. The cost was approximately 4,000,000 crowns or $600,000.

The role of Roch was played by Arnost Navratil, Hart by Lubor Tokos, Arfigas by Miloslav Holub and the girl, Jeanne, by Jana Zatloukalova.

As a result of the success of the film at the Brussels' Fair, Zeman plans to release it in the United States at an early date. ■

ANIMATED TECHNIQUES

(Continued from Page 627)

"dollying" of live-action productions. To produce the effect of the camera moving toward a character or object in animation, the camera on the animation stand is lowered through precision controls toward the drawing and/or cels to be photographed a fraction of an inch between each frame exposure. For the effect of moving away from the object or character, the procedure is reversed. By referring to the field chart, the animator can specify the desired field or fields required for a given effect or to suit the movements of the character. This he indicates in the "Camera Instructions" column of the exposure sheet (Fig. 3), noting the field size he desires and at what point to start trucking to another field position. The field positions are computed by measuring so many units left, right, up or down from the center of the drawing paper.

A camera movement to the right is termed a move "east" to the left, "west," up from center, "north" and down is "south." Field sizes are selected according to the dramatic and compositional requirements of the action. The animator's aim is to maintain good pictorial balance in the scene through choice of proper field size and placement of the camera, and to utilize camera moves freely and flexibly in following the action.

Often, when the script calls for certain visual effects in conjunction with the story action—such as the rocking of a boat—the effect can be rendered by camera manipulation during photography. In the case of the rocking-boat effect, the camera would simply be rocked or tilted slowly from left to right at so many degrees per single frame exposure. A shattering, earth-shaking effect of an explosion can be created by making slight changes in the position of the camera field, and exposing only a frame or two for each position change.

Certain trick effects are made possible by the movement of the camera alone. For example, the effect of approaching some object at a rapid rate from the cartoon character's viewpoint. Here the camera starts from a long-shot position (high on the animation stand) and trucks rapidly down toward the drawing or cels on the animation table. Thus, just about any type of camera-move that is achieved in live-action photography can be approximated in animation. The exceptions are certain types of complicated dolly-shots involving great changes in the backgrounds and perspective—such as following a character up a stairway, around corners, in and out of doors, etc. Such moves would require various parts of the background to progressively change size, shape and perspective during the move which, in animation, would mean that these background changes would have to be meticulously animated in order to achieve the desired natural effect—too costly and tedious a procedure. It has been found that animated backgrounds are rarely satisfactory from the screen point of view for the reason that it is well-nigh impossible to animate rigid or static objects so they will appear "jitter-free" on the screen. All these camera problems and limitations must be thoroughly understood by the cartoon animator.

Still another technical factor which the animator must consider, aside from his drawings, are the various cel levels on which key action must be played. A cel level is the relative position occupied by one or more cels (the celluloid or acetate sheets on which the action

Because it is so well remembered by moviegoers everywhere, frequent reference is made in this series of articles to Walt Disney's memorable animated cartoon production "Bambi" in order to illustrate or clarify the description of various steps and procedures in contemporary animated cartoon production. Augmenting such references are authentic photographs and diagrams relating to the techniques employed in creating this noteworthy film, for which we are indebted to Walt Disney Productions.

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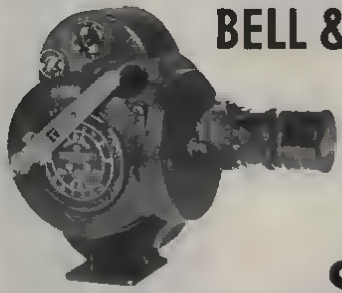

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images are drawn and inked) on the animation stand in the photography step. The set up of a typical animated cartoon while being photographed consists of the background illustration, over which are placed four cels having the necessary inked and painted illustrations on them. The position of each cel—bottom to top—in relation to the background is termed a cel level. The cel on the bottom, next to the background is the 1st level; the one on top, 4th.

The purpose of the multiplicity of cels is to provide a convenient way to handle all of the various characters or effects in action in a scene. Obviously, it would not be practical or even possible to draw all of the action for an average scene on one paper and ink and paint it on a single cell. Invariably there is some action that moves entirely independent of the rest, while other elements in the scene may remain static for a length of time. For this reason it is necessary to break up the action into separate cel levels, according to the discretion of the animator.

In a simple scene, every cel won't have action on it. In a scene where only one character is involved, only one cel level is likely to be employed. However, during the process of shooting, four cels —some of them completely clear—are uniformly employed, stacked one over

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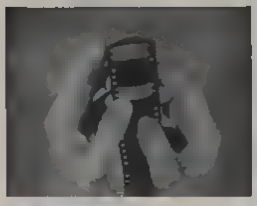

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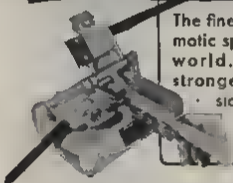

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the other on the animation camera table. This is necessary in order to maintain uniformity in the density and color rendition of the illustration(s) as seen by the camera lens; for the addition or subtraction of just one cell will alter the density of the background and/or of any other drawings on subordinate cells. The effect can be tested by the reader by placing four small chips of celluloid, one over the other, and observing the change in light density that occurs when one or more chips are added or subtracted—even though a single piece of celluloid may appear fully clear to the eye.

Next month we shall continue this discussion of the animator's technical and artistic problems, then proceed to the next phase—cleaning up the roughs, inbetweening, preparing the drawings for inking, etc. •

PHOTOGRAPHY OF "DAMN YANKEES"

(Continued from Page 619)

ability as a songstress and dancer, are revealed for the first time."

"The secret of successful use of colored light in motion picture scenes is getting mellow hues rather than full tone colors," Lipstein pointed out, adding "There is nothing sentimental about strong colored light. Moreover, when subtle hues are properly used, there is no adverse effect on flesh tones. In 'Damn Yankees' I kept flesh tones normal simply by maintaining the colored illumination at the proper key level. In other scenes, where tinted light was underplayed, and therefore not necessarily required on the faces of players, ordinary uncolored light was directed on the players in the normal manner."

When Lipstein was asked what problems, if any, the use of colored light presented in the matter of makeup, he explained: "We did nothing special about makeup for these scenes except to keep it as light in texture as possible—this, in order to get the real character of the players' faces. I believe that where a lot of heavy makeup is plastered on a face, the face loses its character. Thin, light makeup also allows normal skin textures to show through."

Did this general use of colored light in scenes pose any problems in the color temperature of set illumination? Lipstein emphasized that it did not. "I paid very little attention to color temperature, as long as I knew it was around 3200 to 3300 degrees Kelvin. But even were it to fall below this point, its effect — to change color tones—would be absorbed in the general colored light scheme of the set illumination. Any variation—except from scene to scene, of course—would make no visual difference on the screen."

One of the most noteworthy scenes in the picture, from point of colored light use, is a long, sustained musical number in a cafe where Tab Hunter and Gwen Verdon mix with a gala young crowd in dancing to a jive beat. This take, incidentally, ran continuously for almost 800 feet of film. But its unusual length is relatively subordinated from a technical standpoint by the unusual illumination which Harold Lipstein contrived for the scene. "We didn't have a white light anywhere on the set," he said. "Every light, including the set practicals, was a colored one—pink, red, lavender, amber, etc." These were carefully blended both in arrangement and in volume for one of the most colorful and eye-arresting scenes ever to grace a color production.

To augment this multicolored set lighting, the scene was given further pictorial enhancement through use of diffusion—a heavy diffusion disk on the camera plus a gauze in the matte box. "I added the gauze," Lipstein explained, "because I wanted to get a starry effect from the lights and other bright objects in the scene." The net result is a highly-imaginative cinematographic accomplishment that shows what a truly creative director of photography can do for a picture when encouraged by an equally creative screen director.

"When I started to shoot this picture," said Lipstein, "I knew everything that I was going to do; it was all clear in my mind. I didn't approach the task, as is so often the case, with the resigned feeling that 'we'll figure it out when we get on the set.' I was present at every rehearsal, figuring out the camera treatment, discussing it with Director Donen and working together with him in its planning. This is the only way to do it for a successful result and for saving production costs."

Equally worthy of mention is the way the moving camera was employed in much of the picture, and particularly the lengthy boom shot employed in photographing the remarkable baseball players' ballet, which is a high point of the picture. The ballet, featuring a dozen or more baseball players in uniform, was staged in Wrigley Field in Los Angeles, with the camera boom executing one of the most intricate patterns of movement ever conceived for a musical number performed outside a sound stage. (See photo on page 619).

The photographic result of this scene was due a great deal to extensive planning and rehearsal. "Not so much rehearsal of the boom maneuver," said Lipstein, "because we had good technicians on the equipment. But extensive rehearsals of the baseball players per-

forming the dance number were required, and it was during these rehearsals that Donen and I plotted the camera treatment of the scene. While choreographer Bob Fosse rehearsed the dance routines, we made dry runs with the boom without tracks and studied the action through the camera finder. Then we had the tracks laid and placed the necessary marks on the ground to indicate the various 'stop' positions as a guide for the boom operator.

"When it came time to shoot the scene, the camera crew had so thoroughly memorized the routine that it was a simple matter for them to move the camera back and forth at different elevations and for various distances to gain the variety of camera viewpoint we required for the desired pictorial impact."

So subtle and unobtrusive is the use of the mobile camera throughout the picture that it requires a second or third viewing of it to fully appreciate the skillful manner in which it was used as well as its esthetic contribution to the photography. How it enhanced the photography is readily explained by Lipstein who says: "You can tell any screen story better by means of mobile camera shots. This is a technique that is particularly suitable to musical films, where dance or song numbers are best presented in long, continuous takes." Whenever the mobile camera is moved, he added, it should be for a definite purpose—to motivate the story—not for visual effect alone.

There are some tricks performed in this picture that are interesting, yet involve little in the way of special photographic treatment. None of them involved the studio's special photographic effects department. The tricks are performed by Ray Walston in his role as the Devil—such things as causing a cigarette to light itself, snatching playing cards out of thin air, and transforming a person from age to youth, or vice versa.

The first two were feats of magic which Walston had perfected and used on the stage, while changing a person from one character to another was done in the method familiar to all cameramen—stopping the camera at the right moment, marking position of the player in the scene and replacing him with another person, then starting the camera again for a resumption of the action.

"These shots were overlapped slightly in optical printing and a vignette effect introduced where one take ended and the other began in order to diffuse any possible 'jump' in position of the characters at the point where the change takes place," Lipstein explained.

"The production was scheduled for 44 days, but we wound it up in 32," says Lipstein. "Because most of the cast of original Broadway players knew every

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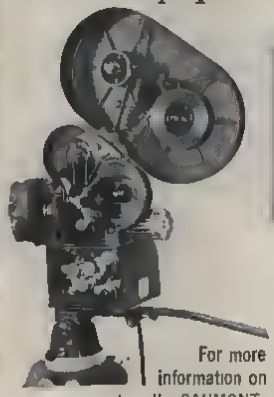

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line, tune and dance number pretty well by heart, rehearsal time was cut to a minimum, leaving us more time for planning the photography of the picture.

"Thorough planning! That's the main thing for success in the photography of any motion picture," Lipstein emphasized. "If you plan a picture thoroughly in advance of going before the camera, everything goes well and much time is saved—and consequently much of the production cost, too. Which always makes the studio happy," he concluded.

EXPOSURE CONTROL

(Continued from Page 637)

cell's performance, according to Elgeet's engineers.

To extend the usefulness of a Synchronex lens-equipped camera, provision has been made for a low-level light indicator which is always visible to the camera operator. Thus, whenever there is insufficient light for successful color photography, the LLL indicator needle dips into a shrouded translucent section on a dome on top of the lens barrel.

The f/1.8 speed of the lens will permit full color photography at normal speeds under most daylight conditions, and the extreme depth of field inherent in a lens of this focal length (13mm) eliminates the need for focusing.

The lens may be set for use with color films in the range from ASA 10 to 16. There is also provision for setting the stops manually, thus extending its versatility for special photographic applications as when the camera is reset from normal f-p-s speeds to that for such applications as stop motion, slow motion and high-speed effects. When switching to manual settings, the lens provides the full range of apertures from f/1.8 to f/16, and the automatic coupling is disengaged until the lens is once again set to "automatic." Because of the sealed-in iris construction, oils from within the camera, spray in the atmosphere, industrial fumes or other alien influences cannot interfere with the lens performance.

Although the first Synchronex lenses have been designed especially for 8mm cameras, it is likely that lenses of a similar type are in course of development for professional 16mm and 35mm cameras—although the manufacturer is presently non-committal on this.

The first cine camera to be designed for introduction with the Elgeet Synchronex as a component element is the foreign-made Eumig Unilectra. But present owners of 8mm cameras having lenses which are interchangeable may enjoy this fully-automatic electric eye automation by replacing the regular lens with a Synchronex. List price is approximately $60.

DO-IT-YOURSELF SOUND

(Continued from Page 637)

5. *Schedule for sufficient time.* The narrator who has to work with one eye on the script and the other on the clock is presented with a hopeless hazard. It's a rare man who can do a good job in this situation.

In the actual recording process, we use a 12-ft. leader at the head of each recording reel, with the sync punch 6-ft. from the first frame of photography. We thread the leader in the workprint projector with the punched hole in the projector aperture. When we start the recording process, we first make sure that our recording machine is up to speed, then we read the identification into the microphone (such as "Narration for Main Title . . . Reel 1 of 2 reels . . . 1 . . . 2 . . . 3 . . . Start") and start the projector on the word "START". We will then have a visible cue-mark on the workprint (the punched hole) and an audio cue on the recording material (the word "Start").

The above is something of a free and easy high-speed coverage of the business of recording the narrator. The various points will be discussed in greater detail in ensuing articles. ■

INDUSTRY NEWS

(Continued from Page 600)

ers," Tutwiler has surpassed his achievements in "Strategic Air Command," which brought him renown and increased stature as a cinematographer.

In "The Hunters," "Tut" had fast jet fighter planes as his subjects, which required a sharp eye and a nimble mind and body to follow with the camera as they zoomed through the sky in the many air scenes that make up a substantial portion of this production.

Accolades are also due a relatively unknown cinematographer, a Japanese by name of Kazuo Yamada, for the superlative job of color photography of the Toho Studios production "The Rikisha-Man." Photographed in Agfa-Color in Toho-Scope (a Japanese version of Cinema-Scope), Yamada displays tremendous imagination both in his set lightings and use of the camera. His night shots are impressively realistic. And his pictorial compositions are often breathtaking in scope and color composition, especially the scenes of the Gion Festival. In lauding cinematographer Yamada, we are not unmindful of the contributions of the director, Hiroshi Inagaki; but it is the photography of this picture that speaks so eloquently of the fine cinematic artistry that is being developed in Japan.

—*A.E.G.*

PHOTOGRAPHIC ASSIGNMENTS

Who, where and what the industry's cameramen were shooting last month.

★ Asterisks indicate commercial and television film productions

ALLIED ARTISTS

● Lucien Ballard ASC, "Al Capone" (Burrows-Ackerman Prod.) with Rod Steiger and Fay Spain. Richard Wilson, director

● Carl Guthrie, ASC, "The House on the Haunted Hill" (Susina Assoc.) with Vincent Price and Carol Ohmart. William Castle, producer director

● William Margulies, "Gangster's Boy" with Stephen McNally and Coleen Gray. Paul Landres, director

AMERICAN NATIONAL

● Monroe Askins, "Bat Masterson"* (Ziv-TV) with Gene Barry. Eddie Davis, director

● Curt Fetters, "World of Giants"* (Ziv-TV) with Marshall Thompson. Monroe Askins, director

● Boa Hoffman, "Sea Hunt"* (Ziv TV) with Lloyd Bridges. Various directors. "Highway Patrol"* (Ziv-TV) with Broderick Crawford. Lew Landers, director. "MacKenzie's Raiders"* (Ziv TV) with Richard Carlson. Various directors. Old Gold commercial* Eddie Davis, director

● Glen MacWilliams, ASC, "Highway Patrol"* (Ziv TV) with Broderick Crawford. Jack Herzberg, director. "Rough Riders"* (Ziv TV) with Kent Taylor. John Rich, director

● Jack Marquette, "Rough Riders"* (Ziv-TV) with Kent Taylor. Various directors.

● Richard Rawlings, "Highway Patrol"* (Ziv TV) with Broderick Crawford. John Florea, director. "MacKenzie's Raiders"* (Ziv TV) with Richard Carlson. Derwin Abbe, director

● Roger Sherman, "Bat Masterson"* (Ziv-TV) with Gene Barry. David Friedkin, director

● Charles Van Enger, ASC, "MacKenzie's Raiders"* (Ziv TV) with Richard Carlson. Abner Biberman, director. "Target"* (Ziv-TV) with Adolphe Menjou. Sutton Roley, director. "Bat Masterson"* (Ziv-TV) with Gene Barry. Various directors.

CALIFORNIA STUDIOS

● David Horsley, ASC, Sterling Drug commercial* (Roland Reed Prods.) Arthur Pierson, director

● Fleet Southcott, "Gunsmoke"* (Filmaster Prods.) with James Arness and Dennis Weaver. Various directors.

● Stuart Thompson, ASC, "Have Gun, Will Travel"* (Filmaster Prods.) with Richard Boone. Various directors

CASCADE PICTURES

● Elwood Bredell, ASC, Mars Candy Bar commercial* Stuart Frye, director

● Roy Seawright, Hamm's beer commercial* George Seitz, director

COLUMBIA

● Gert Andersen, ASC, "The Donna Reed Show"* (Screen Gems) with Donna Reed. Oscar Rudolph, director

● Kit Carson, "Father Knows Best"* (Screen Gems) with Robert Young and Jane Wyatt. Peter Tewksbury, director. "The Ed Wynn Show"* (Screen Gems) with Ed Wynn. Jack Donahue, director

● J. Burgi Contner, ASC, "Naked City"* (Shelle Prods., Screen Gems, shooting in N. Y.) with John McIntyre and James Franciscus. Wm. Beaudine and S. Rosenberg, directors.

● Ray Cory, ASC, "Alcoa Goodyear Theatre"* (Screen Gems). Boris Sagal, director. "Tales of the Texas Rangers"* (Screen Gems) with Willard Parker. George Blair, director

● Henry Freulich, ASC, "Shirley Temple's Storybook"* (Screen Gems) with Shirley Temple. Mitch Leisen, director

● Burnett Guffey, ASC, "Alcoa-Goodyear Theatre"* (Screen Gems) Various directors.

● Fred Jackman, Jr., "Juke Box Jamboree" with Jack Jones and Jo Morrow. Arthur Dreifuss, director. "The Ed Wynn Show"* (Screen Gems) with Ed Wynn. Jack Donahue, director

● Charles Lawton, ASC, "Ride Lonesome" (Ranown Prods., shooting in Lone Pine, CinemaScope & Color) with Randolph Scott and Karen Steele. Budd Boetticher, producer director. "Alcoa-Goodyear Theatre"* (Screen Gems) Sidney Miller, director

● Irving Lippman, "Behind Closed Doors"* (Screen Gems). Various directors

● Ted Moore, "The Bandit" (Warwick Prods.; CinemaScope & Color, shooting in Spain) with Victor Mature. John Gilling, director.

● Frank Phillips, "Jefferson Drum"* (Screen Gems) with Jeff Richardson. Harmon Jones, director

● Philip Tannura, ASC, "The Ed Wynn Show"* (Screen Gems) with Ed Wynn. Jack Donahue, director

WALT DISNEY

● Gordon Avil, ASC, "Zorro"* with G. Williams. Charles Barton, director

● Edward Colman, ASC, "The Shaggy Dog" (Walt Disney Prods. for Buena Vista release) with Fred MacMurray and Jean Hagen. Charles Barton, director

● William Snyder, ASC, "Elfego Baca"* with Robert Loggia and James Dunn. Christian Nyby, director. "John Slaughter"* with Tom Tryon and Robert Middleton. Henry Keller, director

● Harry Waxman, "Third Man on the Mountain" (Technicolor, Walt Disney Prods. Ltd. for Buena Vista release, shooting in Switzerland) with Michael Rennie and James McArthur. Ken Annakin, director.

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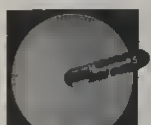

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FILMCRAFT STUDIOS

● VIRGIL MILLER, ASC, "You Bet Your Life"* with Groucho Marx Robert Dwan, director.

FOX WESTERN AVE.

● GEORGE DISKANT, ASC, "Dick Powell's Zane Grey Theatre"* (Four Star Prods.) with Dick Powell, John English, director; "The Rifleman"* (Four Star Prods.) with Chuck Connors. Arthur Laven, director.

● FRANK REDMAN, ASC, "The Perry Mason Show"* with Raymond Burr. Various directors

● GUY ROE, ASC, "Trackdown"* (Four Star Prods.) with Robert Culp Thomas Carr, director.

GENERAL SERVICE

● BRYDON BAKER, "Bold Journey"* (Advenca Prods.). Leon Barsha, director

● NEAL BECKNER, "The Adventures of Ozzie & Harriet"* (Stage 5 Prods.) with Ozzie, Harriet, David & Rickey Nelson Ozzie Nelson, director

● AACH DALZELL, "Flight"* (McCadden Prods.) Jean Yarbrough, director

● JAMES VAN TREES, ASC, "The George Burns Show"* (McCadden Prods.) with George Burns Rod Amateau, director

● HARRY WILD, ASC, "Bob Cummings Show"* (Laurmac Prods.) with Bob Cummings and Rosemary DeCamp. Bob Cummings, director

GOLDWYN STUDIOS

● NORBERT BRODINE, ASC, "Loretta Young Show"* (Lewislar Prods.) with Loretta Young. Various directors.

● LEON SHAMROY, ASC, "Porgy and Bess" (Samuel Goldwyn Prods., Columbia release, Todd-AO; color) with Sidney Poitier and Dorothy Dandridge. Otto Preminger, director.

INDEPENDENT

● JOHN ALTON, "Lonelyhearts" (Schary Prods. for UA) with Montgomery Clift, Robert Ryan and Myrna Loy. Vincent Donehue, director.

● JACK HILDYARD, "The Devil's Disciple" (Hecht-Hill-Lancaster; UA release; shooting in London) with Laurence Olivier, Kirk Douglas and Burt Lancaster, Alexander Mackendrick, director.

● CARL KAYSER, "Machete"* (Pilot, Gil Ralston Prods., New York; shooting in Tahiti) with R Jaeckel and J. Sebastian Lee Robinson, director.

● CHARLES LANG, JR., ASC, "Some Like It Hot" (Ashtan Prods.—Mirisch Co. for UA release) with Marilyn Monroe and Tony Curtis. Billy Wilder, director

● PHILIP LATHROP, "Cry Tough" (Hecht-Hill-Lancaster for UA release) with John Saxon and Linda Cristal Paul Stanley, director.

● MICHAEL NERRIA, Series of TV spot announcements for NBC (Gerald Prods., shooting in New York). Gerald Aurbach, director.

● TED PAHLE, ASC, "The Fourth Dimensional Man" (Fairview Prods., DeLuxe color, shooting in Penna.) with Lee Meriwether and James Congdon Jack H. Harris, producer director.

● GIUSEPPE ROTUNNO, "The Naked Maja" (Titanus-Metro for UA release, shooting in Rome) with Ava Gardner and Anthony Franciosa. Henry Koster, director.

● ALAN STENSVOLD, ASC, "Mr Pharaoh and the Cleopatra" (Eldorado Prod.), shooting in Havana, Cuba) with Gilbert Roland and Dina Merrill Don Weis, director

● GILBERT WARRENTON, ASC, "Paratroop Attack" (American International) with Richard Bakalyn and Jack Hogan. William Witney, director.

● FRED YOUNG, "Solomon and Sheba" (Thanco Prod. for UA; shooting in Spain) with Tyrone Power and Gina Lollobrigida. King Vidor, director

KEYWEST STUDIOS

● WALTER STRENGE, ASC, Series of Religious pictures (Family Films) William Claxton and William Schuster, directors.

KTTV STUDIOS

● WALTER STRENGE, ASC, "Fury"* (TPA Prods.) with Peter Graves and Bobby Diamond. Ray Nazarro, director

LA BREA PRODS.

● RAY FOSTER, ASC, Chesterfield commercial*. Hank Ludwin, director

● WILLIAM MARGULIES, Knowland for Governor*. Hank Ludwin, director

LINKLETTER PLAYHOUSE

● ALAN STENSVOLD, ASC, "People Are Funny"* (John Guedel Prods.) with Art Linkletter, Irvin Atkins, director.

McGOWAN STUDIOS

● BRYDON BAKER, "Death Valley Days"* (McGowan Prods.) with Jack Grant. Stuart McGowan, director

● WILLIAM BRADFORD, ASC, "Sky King"* (McGowan Prods.) with Kirby Grant and Gloria Winters Paul Landres, director

METRO-GOLDWYN-MAYER

● ROBERT BRONNER, ASC, "The Mating Game" with Debbie Reynolds and Tony Randall. George Marshall, director

● ROBERT BURKS, ASC, "North by Northwest" with Cary Grant and Eva Marie Saint. Alfred Hitchcock, producer-director

● ELLIS CARTER, ASC, "Night of the Quarter Moon" with Julie London and John Drew Barrymore, Hugo Haas, director.

● STEPHEN DADE, "The Angry Hills" (shooting in Greece) with Robert Mitchum and Elizabeth Mueller Robert Aldrich, director.

● WILLIAM DANIELS, ASC, "Some Came Running" (Color) with Frank Sinatra, Dean Martin and Shirley MacLaine. Vincente Minnelli, director,

● GEORGE FOLSEY, ASC, "The Blessing" (Shooting in London) with Deborah Kerr and Rossano Brazzi Jean Negulesco, director.

● JOSEPH RUTTENBERG, ASC, "Green Mansions" (CinemaScope and Metrocolor) with Audrey Hepburn and Anthony Perkins. Mel Ferrer, director

● LESTER SHORR, ASC, "Col Humphrey J. Flack"* (Joyd-Pan Prods.) with Alan Mowbray and Frank Jenks Various directors.

● WILLIAM SPENCER, "The Thin Man"* with Peter Lawford and Phyllis Kirk. Richard Kinon, director.

● ROBERT SURTEES, ASC, "Ben-Hur" (Metrocolor; camera 65; shooting in Italy) with

Charlton Heston and Jack Hawkins. William Wyler, director.

● ALDO TONTI, "For the First Time" (Corona Films MGM release. Technirama, shooting in Italy and Germany) with Mario Lanza and Zsa Zsa Gabor. Rudy Mate, director.

MOTION PICTURE CENTER

● LUCIEN ANDRIOT, ASC, "The Californians"* (Desilu Prods.) with Richard Coogan Various directors.

● CHARLES BURKE, "This Is Alice"* (Desilu Prods.) with Patty Ann Gerrity Sidney Salkow, director.

● HENRY CRONJAGER, "Wyatt Earp"* (Desilu Prods.) with Hugh O'Brian Frank MacDonald, director

● ROBERT DeGRASSE, ASC, "Danny Thomas Show"* (Desilu Prods.) with Danny Thomas. Sheldon Leonard, director; "Red Skelton Show"* (Desilu Prods.) with Red Skelton

● ROBERT HAUSER, "Derringer"* (Desilu Prods.) with Jack Mahoney. Various directors, "Man with a Camera"* (Desilu Prods.) with Charles Bronson. Richard Sale, director.

● STO HICKOX, ASC, "December Bride"* (Desilu Prods.) with Spring Byington and Francis Rafferty. Frederick DeCordova, director, "Red Skelton Show"* (Desilu Prods.) with Red Skelton George Sidney, director.

● PAUL IVANO, "Desilu Playhouse"* (Desilu Prods.) Various directors.

● NICK MUSURACA, ASC, "Desilu Playhouse"* (Desilu Prods.). Allen Reisner, director.

● KENNETH PEACH, ASC, "Lassie"* (Jack Wrather Prods.) with Jon Provost and June Lockhart Various directors.

● ROBERT PITTACK, ASC, "Ann Sothern Show"* (Desilu Prods.) with Ann Sothern. Various directors.

● CLARK RAMSEY, ASC, "U.S. Marshall"* (Desilu Prods.) with John Bromfield Harve Foster, director

● CHARLES STRAUMER, "The Texan"* (Desilu Prods.) with Rory Calhoun. Alvin Ganzer, director

● LOTHROP WORTH, ASC, "The Real McCoy's"* (Brennan-Westgate Prods.) with Walter Brannan Hy Averback, director.

PARAMOUNT

● STANLEY CORTEZ, ASC, "Between the Thunder and the Sun" (Seven Arts Prods.) with Susan Hayward, Jeff Chandler, and Jacques Bergerac Russell Rouse, director.

● LOYAL GRIGGS, ASC, "The Hangman" with Robert Taylor, Fess Parker and Tina Louise Michael Curtiz, director.

PARAMOUNT SUNSET

● MAURY GERTSMAN, ASC, "Gunfighters of Abilene" (Zenith Pictures UA release) with Buster Crabbe and Judith Ames Edward L. Cahn, director

● WILLIAM SKALL, ASC, "Rescue"* (Cinehlm Inc.) with Jim Davis. Robert Walker, director.

● ALAN STENSVOLD, ASC, "Night Court"* (Sandy Howard Prods.) with Jay Jostyn. Sandy Howard, director.

REPUBLIC STUDIOS

● BENJAMIN KLINE, ASC, "Wagon Train"* (Revue Prods.) Various directors, "General Electric Theatre"* (Revue Prods.). James Nielson, director

● LIONEL LINDON, ASC, "General Electric Theatre"* (Revue Prods.) Various directors, "Alfred Hitchcock Presents"* (Revue Prods.) Various directors.

● JACK MacKINZIE, ASC, "Cimmeron City"* (Revue Prods.) with Richard Bartlett, director; "State Troopers"* (Revue Prods.) with Rod Cameron Richard Irving, director.

● RAY RENNAHAN, ASC, "Restless Gun"* (Window-Glen Prods.) with John Payne. Justus Addiss, director; "Schlitz-Lux Playhouse"* (Revue Prods.). John Brahm, director, "M Squad"* (Latimer Prods.) with Lee Marvin. David Rich, director

● JOHN RUSSELL, ASC, "Alfred Hitchcock Presents"* (Revue Prods.). Robert Stevens, director, "M Squad"* (Latimer Prods.) with Lee Marvin. Boris Sagal, director; "General Electric Theatre"* (Revue Prods.) Various directors; "Schlitz-Lux Playhouse"* (Revue Prods.). Andrew McCullough, director

● WILLIAM SICKNER, ASC, "Bachelor Father"* (Bachelor Prods.) with John Forsythe. John Newland, director, "Leave it to Beaver"* (Gomalco Prods.) with Barbara Billingsley and Hugh Beaumont Norman Tokar, director, "M Squad"* (Latimer Prods.) with Lee Marvin. Donald Medford, director

● MACK STENGLER, ASC, "Schlitz-Lux Playhouse"* (Revue Prods.) John Brahm, director, "Leave it to Beaver"* (Gomalco Prods.) with Barbara Billingsley and Hugh Beaumont Norman Tokar, director

● ELLIS THACKERY, ASC, "Wells Fargo"* (Overland Prods.) with Dale Robertson. Earl Bellamy, director.

HAL ROACH STUDIOS

● EDWARD FITZGERALD, ASC, "The Gale Storm Show"* with Gale Storm and ZaSu Pitts William Seiter, director

20TH CENTURY-FOX

● CHARLES CLARKE, ASC, "The Sound and the Fury" (CinemaScope & Color; Jerry Wald Prods.) with Yul Brynner and Joanne Woodward Martin Ritt, director

● WILFRID CLINE, ASC, "Mardi Gras" (CinemaScope & Color) with Pat Boone and Christine Carrere Ed Goulding, director.

UNIVERSAL-INTERNATIONAL

● ARTHUR ARLING, ASC, "Steve Canyon"* (Pegasus Prods.) with Dean Fredericks. Don Taylor, director, "Peter Gunn"* (Sparta Prods.) with Craig Stevens Various directors, "Homestead USA" (World Wide Pictures). Dick Ross, director

● JAMES DROUGHT, Ford and Dodge commercials*. Jack Daniels, director.

● RAY FERNSTROM, ASC, "Steve Canyon"* (Pegasus Prods.; aerial photography). Don Taylor, director.

● MAURY GERTSMAN, ASC, "Steve Canyon"* (Pegasus Prods.) with Dean Fredericks. Don Taylor, director; "Peter Gunn"* (Sparta Prods.) with Craig Stevens Various directors; "Homestead USA"* (World Wide Pictures). Dick Ross, director

(Continued on Page 654)

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PHOTOGRAPHIC ASSIGNMENTS

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● PHILIP LATHROP, "Rawhide"* (CBS-TV) Various directors

● RUSSELL METTY, ASC, "Imitation of Life" (CinemaScope & Color) with Lana Turner and John Gavin. Douglas Sirk, director.

● CLIFFORD STINE, ASC, "Homestead USA"* (World Wide Pictures) Dick Ross, director Kellogg commercial* David Monahan, director.

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● WESLEY ANDERSON, "Cheyenne"* with Ty Hardin Lee Sholem, director, "Sugarfoot"* with Will Hutchins. Various directors.

● CARL BERGER, ASC, "77 Sunset Strip"* with Efrem Zimbalist, Jr. Stuart Heisler, director, "Lawman"* with John Russell. Stuart Heisler, director

● JOSEPH BIROC, ASC, "The FBI Story" (Technicolor) with James Stewart and Vera Miles. Mervyn LeRoy, director

● EDWIN DUPAR, ASC, "Sugarfoot"* with Will Hutchins. Various directors. "Lawman"* with John Russell Charles Lederer, director; "Cheyenne"* with Ty Hardin Alan Crosland, director.

● ARTHUR FEINDEL, ASC, Kaiser Aluminum commercial*. Thomas Armistead, director

● PERRY FINNERMAN, "77 Sunset Strip"* with Efrem Zimbalist, Jr Stuart Heisler, director.

● RAY FOSTER, ASC, Camel commercial* Thomas Armistead, director, Kaiser Aluminum commercial*. Various directors. General Motors commercial* Harold Daniels, director; General Mills commercial*, Bud Townsend, director.

● CARL GUTHRIE, ASC, "Up Periscope" (WarnerColor) with James Garner, Edmond O'Brien and Joanne Barnes. Gordon Douglas, director. Kaiser Aluminum commercial*. George Shearman, director.

● ERNEST HALLER, ASC, "The Miracle" HALLER, ASC, "The Miracle" (Technirama-Technicolor) with Carroll Baker and Walter Slezak Irving Rapper, director

● MICHEL KELBER, "John Paul Jones" (Technicolor; John Paul Jones Prods.; shooting in Spain) with Robert Stack, Charles Coburn and Erin O'Brien. John Farrow, director.

● WARREN LYNCH, "Lawman"* with John Russell. Douglas Heyes, director

● PEVERELL MARLEY, ASC, "Colt 45"* with Wayde Preston. Lee Sholem, director, "77 Sunset Strip"* with Efrem Zimbalist, Jr. Lee Sholem, director.

● HAROLD STINE, ASC, "Maverick"* with Jack Kelley. Various directors.

● HARRY STRADLING, ASC, "The Philadelphian" with Paul Newman and Barbara Rush Vincent Sherman, director.

● RALPH WOOLSEY, ASC, "Lawman"* with John Russell Various directors; "77 Sunset Strip"* with Efrem Zimbalist, Jr Various directors.

LENS COUPLED METERS

(Continued from Page 632)

designed with simplification in mind, as is obvious from the features described above. It is an 8mm camera which has incorporated about every feature that is found on professional cameras, and since the Compumatic system has proven itself on such a camera, we might very well ask whether it would not also be the perfect light-measuring system for professional use. ■

Bell & Howell's variable-focus lens for 16mm movie projectors is said to solve many problems caused by varying projection distances and screen sizes.

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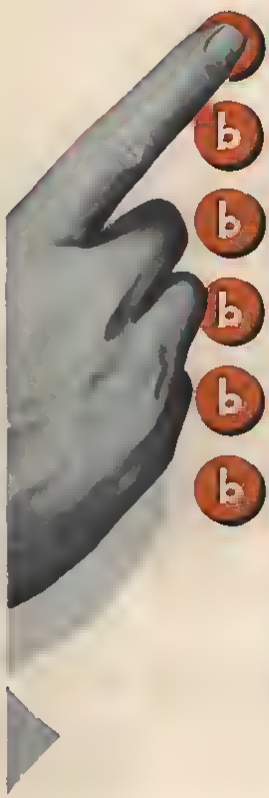

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